

ANDALEX RESOURCES WILDCAT LOADOUT

C/007/033

CHANGE TO THE MINING & RECLAMATION PLAN

*******TEXT AND APPENDICES*******

THIS SUBMITTAL INCLUDES:

- 1) RESPONSE TO DIVISION ORDER DO-04
(a.k.a. WIND-BLOWN FINES)
- 2) EXPANSION OF THE PRIMARY COAL STORAGE
AREA
- 3) PREPARATION OF A MATERIAL STORAGE
AREA

SUBMITTED: MAY 9, 2007

21

File in:
☐ Confidential
☐ Shelf
☒ Expandable
Refer to Record No 0007 Date 5/24/07
In C/ 007/033, 2007, Incoming
For additional information

CHAPTER 1, LEGAL

NOTE TO REVIEWERS: The Wildcat MRP was recently re-formatted to the newer R645 regulations. This reformatted MRP was recently approved and incorporated on May 17, 2006. The current amendment is referred to as the 2007 Modification Plan and consists of three components, namely; 1) addressing Division Order DO-04 regarding wind-blown fines, 2) expanding the primary coal storage pad by about 3.5 acres, and 3) provide for a new material storage area of about 6 acres located on the west side of the facility.

Because the Wildcat MRP was recently reformatted and approved, every effort has been made in this amendment to minimize text changes, as pertains to responses to specific regulations, except where necessary to avoid inconsistencies and contradictions. Where possible, response to individual regulations regarding the proposed 2007 Modification Plan amendment have been made by referring the reviewer directly to Appendix S. This appendix contains a detailed description of the amendment and is presented in a narrative that integrates the various components which are normally addressed in the separate chapters. Within the chapters themselves, all new discussion relevant to the 2007 Modification Plan amendment is presented in italics to easily differentiate it from the previously approved and reformatted text. The submittal also utilizes the standard "redline/strike-out" to aid in the review.

R645-301-100. GENERAL

**R645-301-110. LEGAL, FINANCIAL, AND COMPLIANCE
INFORMATION**

Legal, Financial, Compliance and Information

The objective of this chapter is to set forth all relevant information concerning ownership and control of Andalex Resources, Inc., the ownership and control of the property to be affected by mining activities and all other information and documentation required.

Compliance Information

a) Suspension and Revocation

approval.

B. Overview and Summary of Project

Coal storage and loading activities at Wildcat started officially on April 2, 1985, when the first coal was brought there for storage and eventual loadout, under a permit issued to Andalex Resources by the Bureau of Land Management, U.S. Department of the Interior. This coal loadout facility is located approximately three miles west of U.S. Highway 6, Consumer's Road, Helper, Utah, in Carbon County and can be more accurately described as parts of Section 33, Township 13 South, Range 9 East, S.L.B. & M. (please see Figure 1). The property contains approximately ~~100.19~~ 270 acres, of which 12.5 acres are under lease to the Utah Railway by the Bureau of Land Management. The serial number for this right-of-way is U-48027.

There are no perennial streams or bodies of water on the property. Water for culinary purposes is supplied by Price Municipal Corporation and hauled down to the facility using approved culinary tank trucks. The water is in turn stored in an approved culinary tank at the loadout.

Historically, coal loading activities had been the sole use for this permit area, even prior to being leased to Andalex Resources. This is evidenced by the fact that the soil survey of the area revealed that of the eight test holes, two completely lacked topsoil and one located along the tracks had approximately two feet of fine coal and no topsoil. Coal had been stored along the tracks for shipping purposes in the past. It is appropriately justifiable to conclude that Andalex's proposed use of the area for coal storage and loading activities will be fully compatible with its' previous use, and as such, no significant new disturbance of the area has occurred. Observations have shown that the previous land use consisting of wildlife habitat and migrations has not been interrupted. This is evidenced by repeated sightings of deer herds moving through the permit area. Other mammals and birds continue to use this area for their habitat. Access to the loadout and storage facility is by paved county and state roads, which are also maintained by the county and state.

Coal is hauled from the Centennial Mine, Genwal

Resources, and West Ridge Mine. ~~All surface and support facilities necessary for present operations have been completed. There are no additions or modifications proposed at this time.~~ Aside from the DOGM permit, Andalex Resources has acquired all the necessary approvals, licenses, rights-of-way, and permits at both state and federal levels to conduct coal storage and loading operations on the plan area. The facility is designed to handle loading and crushing activities up to 5.5 million tons per year.

Upon cessation of coal loading activities, reclamation activities will commence in accordance with the plans outlined in this application. The land will be restored to a condition equal to or better than the premining condition, according to available technology.

This facility is located in an area where mining and it's related activities have been the main industry, and as a result, the surrounding communities are properly adapted. The labor supply is excellent and well trained. With all these considerations, coupled with the prudent management at Andalex, the Wildcat Coal Loadout Facility is a model operation in the Carbon County area with no significant environmental or socioeconomic impact.

C. Organization of Application

This permit application has been organized in accordance with the general requirements for format and contents as outlined in the R645 Coal Mining Rules.

R645-301-112. IDENTIFICATION OF INTERESTS.

Identification of Interests

1. Permit Applicant

Andalex Resources, Inc.
Tower Division
P.O. Box 902
Price, Utah 84501
(801) 637-5385

2. Legal and Equitable Owners of Record

The addresses of owners of record are as follows:

ANDALEX RESOURCES, INC.

WILDCAT LOADOUT

MINING AND RECLAMATION PLAN

R645-301

CHAPTER 1

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Andalex Resources, Inc., affiliates or persons controlled by or under common control with Andalex haven't had a mining permit suspended or revoked within the last five years.

b) Forfeiture of Bond

Andalex Resources, Inc., affiliates or persons controlled by or under common control with Andalex have not forfeited a mining bond or similar security in lieu of bond.

c) History of Violations

Appendix B, *Part B* contains a listing of all violations received within the last three years prior to the date of this application by Andalex and affiliated companies.

R645-301-111. INTRODUCTION

Introduction and Overview of Project Permit Application

A. Introduction

This permit application is being submitted by Andalex Resources, Inc., in order that coal can be stored and loaded out of it's coal loadout facility located at Wildcat Junction, near Helper, Utah. This facility is known as the Wildcat Loadout. Andalex is a corporation organized and existing under the laws of the state of Delaware and qualified to do business in Utah. Andalex Resources has a permit to operate it's coal loading and storage facility known as Wildcat Loadout, in accordance with the appropriate regulations. This coal loadout facility is located on land owned by the United States of America in Carbon County, Utah.

Andalex was granted the right-of-way in January, 1982, by the Bureau of Land Management of the United States Department of the Interior. Andalex Resources, the designated operator, along with AMCA Coal Leasing, Inc., its' land acquisition and development branch, control all lands within the proposed coal loadout facility area. Andalex Resources, Inc., has therefore prepared this coal loadout facility permit application rewritten under the R645 Coal Mining Rules format, for submission to the appropriate regulatory authorities for review and

Bureau of Land Management
Utah State Office
Federal Building
Salt Lake City, Utah 84111
(801) 524-3004

Utah Railroad
P.O. Box 11608
Salt Lake City, Utah 84147
(801) 521-3447

Andalex Resources, Inc.
Tower Division
P.O. Box 902
Price, Utah 84501
(801) 637-5385

All land within the permit area in question is owned by the United States of America and is leased by the Utah Railroad Corporation and Andalex Resources, Inc.

3. Purchaser's of Record Under Real Estate Contracts

There are no purchasers of record under any real estate contracts of areas to be affected by surface operations and facilities of this loadout, and there are no purchasers of record under any real estate contracts of the coal to be loaded out.

R645-301-112.100. TYPE OF BUSINESS

Andalex Resources, a corporation organized and existing under the laws of Delaware and qualified to do business in Utah, operates the Wildcat Loadout Facility. This facility stores, processes and ships coal for various operations in the area. This mining permit application has been prepared by Andalex Resources and is being submitted for review and approval by the appropriate regulatory authorities.

R645-301-112.200. NAMES, LOCATIONS, RESIDENT AGENT

Resident Agent who will accept service of process for Andalex Resources, Inc., Wildcat Loadout, ACT/007/033:

David Shaver

Andalex Resources, Inc.
Tower Division
P.O. Box 902
Price, Utah 84501

Also, see Chapter 8, for notarized statement pertaining to completeness and accuracy.

R645-301-112.300. OTHER THAN SINGLE PROPRIETORSHIPS

Andalex Resources, Inc., Tower Division, holds the exclusive coal operating interests in the permit area.

R645-301-112.310. OFFICERS AND SHAREHOLDERS

Refer to Appendix V for information on officers and shareholders.

**R645-301-112.320. OWNERSHIP AND CONTROL RELATIONSHIP
TO APPLICANT**

Refer to Appendix V for ownership and control information.

**R645-301-112.400. PENDING, CURRENT AND PREVIOUS COAL
PERMITS**

A list of current and previous coal mining permits held by Andalex and its affiliates is included in Appendix V.

R645-301-112.500. SURFACE AND MINERAL OWNERSHIP

All surface and subsurface areas contiguous to the permit area are owned by the United States. The name and address of the responsible authority representing the federal government is as follows:

Bureau of Land Management
Utah State Office
Federal Building
Salt Lake City, Utah 84111
(801) 524-3004

**R645-301-112.600. ADJACENT SURFACE AND MINERAL
OWNERSHIP**

Refer to Plate 16 for adjacent surface and mineral ownership.

**R645-301-112.700. MSHA NUMBERS FOR ALL MINE-
ASSOCIATED STRUCTURES**

The Wildcat Loadout and Refuse Pile have the following M.S.H.A. I.D. Numbers:

Loadout	-	MSHA I.D. 42-01864
Refuse Pile	-	MSHA I.D. 1211-UT-09-01864-01

**R645-301-112.800. STATEMENT OF ALL LANDS AND
INTERESTS IN LANDS**

N/A

R645-301-113. VIOLATION INFORMATION

History of Violations

Appendix B, *Part B* contains a listing of all violations received within the last three years prior to the date of this application by Andalex and affiliated companies.

R645-301-113.100. COMPLIANCE INFORMATION

Andalex Resources, Inc., affiliates or persons controlled by or under common control with Andalex haven't had a mining permit suspended or revoked within the last five years.

Andalex Resources, Inc., affiliates or persons controlled by or under common control with Andalex have not forfeited a mining bond or similar security in lieu of bond.

Appendix B, *Part B* contains a listing of all violations received within the last three years prior to the date of this application by Andalex and affiliated companies.

R645-301-113.110. SUSPENDED OR REVOKED PERMITS

Andalex Resources, Inc.
Mine Plan Cross Reference
To Coal Mining Rules R645

Andalex Resources, Inc., affiliates or persons controlled by or under common control with Andalex haven't had a mining permit suspended or revoked within the last five years.

R645-301-113.120. FORFEITED BONDS

Andalex Resources, Inc., affiliates or persons controlled by or under common control with Andalex have not forfeited a mining bond or similar security in lieu of bond.

**R645-301-113.200. EXPLANATION OF PERMIT OF BOND
FORFEITURE**

N/A

R645-301-113.210 PERMIT AND BOND IDENTIFICATION

The following is a list of all other licenses and permits under applicable state and federal land use, air and water quality, water rights, and health and safety laws and regulations held by Andalex Resources in order to operate its coal loading facility. These permits can also be found in Appendix B.

State:

1. State of Utah
 Department of Natural Resources
 Division of Oil, Gas, and Mining
 355 West North Temple
 3 Triad Center
 Suite 350
 Salt Lake City, Utah 84116

Reference I.D.: DOGM PRO 007/033

2. State of Utah
 Department of Health
 Division of Environmental Health
 150 West North Temple
 P.O. Box 2500
 Salt Lake City, Utah 84110

- Air Quality Construction and Operation Permit

Approved July 22, 1982

- Water Quality - Sediment and Drainage
Approved September 15, 1982
- Septic and Culinary Plan (1)
Approved April 1, 1982

Federal:

1. Bureau of Land Management
Utah State Office
Federal Building
Salt Lake City, Utah 84111
 - Right-of-Way
Permit Number U-48027
Granted January 12, 1982
Amended February 5, 2007
2. Environmental Protection Agency
Region VIII
1860 Lincoln Street
Denver, Colorado 80295
 - National Pollutant Discharge Elimination System
(NPDES)
Permit I.D. - UT-0024147
Issued November 4, 1982
 - Prevention of Significant Deterioration of Air
Quality (PSD)
Unissued: Determined by the E.P.A. to be
unnecessary
3. U.S. Department of Labor
Mine Safety and Health Administration (M.S.H.A.)
P.O. Box 25367
Denver, Colorado 80225
(District 9)
Wildcat Loadout Facility I.D. 42-01864

R645-301-113.220. REGULATORY AUTHORITIES INVOLVED

See above

R645-301-113.230. CURRENT STATUS OF PERMIT AND BOND

See above

**R645-301-113.240. ADMINISTRATIVE OR JUDICIAL
PROCEDURES**

Appendix B

R645-301-113.250. CURRENT STATUS OF PROCEEDINGS

Appendix B

R645-301-113.300. LIST OF ALL VIOLATIONS NOTICES

Appendix B

R645-301-113.310. IDENTIFICATION OF VIOLATIONS

Appendix B

R645-301-113.320. DESCRIPTION OF VIOLATIONS

Appendix B

R645-301-113.330. LOCATION OF VIOLATIONS PROCEEDINGS

Appendix B

R645-301-113.340. STATUS OF VIOLATIONS PROCEEDINGS

Appendix B

R645-301-113.350. ACTIONS TAKEN TO ABATE VIOLATIONS

Appendix B

R645-301-114. RIGHT-OF-ENTRY INFORMATION

Andalex Resources, Inc., currently holds approximately ~~100.19~~ 270 acres of federal land which contains the permit area. Andalex bases its' legal right to enter and conduct coal loading activities in the permit area pursuant to the language contained in the right-of-way,

specifically the actual grant (amended) dated March 24, 1982, and amended February 5, 2007 (see Appendix B-12A). This right-of-way was granted under the authority of the Federal Land Policy and Management Act of 1976 (90 Stat. 2776; 43 U.S.C. 1761, Sec. 501 (a)(7)). All valid rights existing on the date of this grant shall apply.

A right to enter and conduct loading activities on the approximately thirteen acres of the permit area leased to the Utah Railroad is contained in the private lease agreement between Utah Railroad and Andalex Resources in November, 1981.

The right-of-way can be described as follows:

U-48027:

Salt Lake Base and Meridian, Utah Township 13 South, Range 9 East, Section 33, ~~NW¹/₄SE¹/₄, N¹/₂SW¹/₄SE¹/₄, SE¹/₄, E¹/₂E¹/₂NE¹/₄SW¹/₄, E¹/₂NE¹/₄SE¹/₄SW¹/₄, NE¹/₄SE¹/₄SE¹/₄SW¹/₄, NW¹/₄SW¹/₄SW¹/₄SE¹/₄, E¹/₂SE¹/₄SW¹/₄NE¹/₄ and portions of N¹/₂NW¹/₄NE¹/₄SE¹/₄, NE¹/₄SW¹/₄NE¹/₄, SW¹/₄SW¹/₄NE¹/₄, NW¹/₄SE¹/₄SW¹/₄NE¹/₄, W¹/₂NE¹/₄SW¹/₄, W¹/₂E¹/₂NE¹/₄SW¹/₄, W¹/₂E¹/₂SE¹/₄SW¹/₄ SE¹/₄SW¹/₄NE¹/₄, E¹/₂SW¹/₄, SE¹/₄~~, containing 270 acres

It is important to note that this is a non-exclusive areal right-of-way, and that there are numerous other equally valid rights-of-way which occupy much of this same area. For example, overlapping rights-of-ways exist for the Utah Railway tracks, the State Highway 139, the Carbon County Consumers Road, the by-pass road, the Trestle public road, Rocky Mountain Power 46 KV powerline, Phillip Petroleum's gas well and pipeline corridor, and Hidden Splendor shop facility. BLM determined the final 270 acre configuration in part to "square up" the boundary for administrative purposes. Being a non-exclusive right-of-way means there is no conflict among grantees, and no inherent liability from one grantee to the next, as long as each grantee's activities are within the terms of their respective right-of-way. Therefore, the SMCRA permit area for the Wildcat loadout has been delineated to coincide with the boundary of the BLM right-of-way U-48027 as described above.

~~In addition, there is a parcel of land 500 feet by~~

~~500 feet square whose southeast corner is located
990 feet east of the center of Section 33.
This Right of Way contains 91 acres, more or less.~~

R645-301-114.100. DOCUMENTATION

Appendix B

**R645-301-114.200. SEVERED SURFACE AND MINERAL
ESTATES**

Appendix B

**R645-301-114.210. WRITTEN SURFACE OWNER CONSENT FOR
COAL EXTRACTION**

N/A

**R645-301-114.220. CONVEYANCE EXPRESSLY GRANTING
RIGHT TO MINE COAL**

N/A

**R645-301-114.230. DOCUMENTATION OF LEGAL AUTHORITY
TO MINE COAL**

N/A

**R645-301-114.300. ADJUDICATION OF PROPERTY RIGHTS
DISPUTES**

The Division does not have the authority to adjudicate property rights disputes.

R645-301-115. STATUS OF UNSUITABILITY CLAIMS

N/A

**R645-301-115.100. IDENTIFICATION OF LANDS
UNSUITABLE**

The permit area is not within an area designated unsuitable for the affects of mining activities, specifically, coal loading

activities, under study for designation in an administrative proceeding initiated under those parts. Further, there are no occupied dwellings within 300 feet of the permit.

**R645-301-115.200. CLAIMS OF EXEMPTION BY COMMITMENT
PRIOR TO JANUARY 4, 1977**

None.

**R645-301-115.300. MINING AND RECLAMATION OPERATIONS
WITHIN 300 FEET OF AN OCCUPIED
DWELLING OR WITHIN 100 FEET OF A
PUBLIC ROAD**

None.

R645-301-116. PERMIT TERM

The requested term of this permit is five years. Andalex will then apply for five year extensions over the life of this operation.

**R645-301-116.100. SCHEDULE OF PHASED MINING AND
RECLAMATION ACTIVITIES**

See R645-301-142

**R645-301-116.200. PERMIT TERM IN EXCESS OF FIVE
YEARS**

The requested term of this permit is five years. Andalex will then apply for five year extensions over the life of the mine.

**R645-301-116.210. COMPLETENESS AND ACCURACY FOR
LONGER TERM**

N/A

**R645-301-116.220. DEMONSTRATION OF NEED FOR LONGER
TERM**

N/A

R645-301-117.

**INSURANCE, PROOF OF PUBLICATION
AND FACILITIES OR STRUCTURES USED
IN COMMON**

Appendix B contains certificates of liability insurance covering personal injury and property damage resulting from this operation.

R645-301-117.100.

LIABILITY INSURANCE

Appendix B

R645-301-117.200.

NEWSPAPER PUBLICATION

A copy of the newspaper advertisement of this Mining and Reclamation Plan and proof of publication of the advertisement is filed with the Division and made part of the complete application. (See Appendix B).

R645-301-117.300.

FACILITIES USED IN COMMON

N/A

R645-301-118.

FILING FEE

N/A

R645-301-120.**PERMIT APPLICATION FORMAT AND
CONTENTS**Summary of Table of Contents

R645-301-100.	General
R645-301-200.	Soils
R645-301-300.	Biology
R645-301-400.	Land Use and Air Quality
R645-301-500.	Engineering
R645-301-600.	Geology
R645-301-700.	Hydrology
R645-301-800.	Bonding and Insurance

R645-301-121.**REQUIREMENTS****R645-301-121.100.****CURRENT INFORMATION**

Information is current.

R645-301-121.200.**CLEAR AND CONCISE**

Information is clear and concise.

R645-301-121.300.**FORMAT REQUIREMENTS**

To facilitate review of the application, each chapter listed above has been further divided into specific parts and sections. These can be found listed in the detailed table of contents appearing at the beginning of this text along with the page numbers on which they appear. This table of contents also contains lists of figures, tables, plates, exhibits, and appendices to facilitate cross referencing between chapters.

Exhibits include appropriate supporting documents, reports and publications and are included as appendices.

Maps which were not reduced to fit into the text are included in

a separate volume as plates. All maps and plans are submitted in accordance with the requirements.

R645-301-122.

REFERENCED MATERIALS

All references and referenced publications and materials are listed under R645-301-130.

R645-301-123.

**APPLICATION FOR PERMITS, CHANGES,
RENEWALS, OR TRANSFERS**

This permit is submitted to update information to the R645 permit format.

R645-301-130.

REPORTING AND TECHNICAL DATA

Preparation of Application

A. Persons and Consultants Involved

The following persons and/or organizations were involved in collection and analysis of the technical data set forth in this application.

1. In House Consulting Services

- a) Andalex Resources, Inc., AMCA Coal Leasing, Inc.
Samuel C. Quigley - General Manager
Michael W. Glasson - Senior Geologist
David E. Shaver - Chief Engineer

2. Outside Consulting Services

- a) Dan W. Guy - Registered Professional Engineer
(State of Utah No. 4548)
Price, Utah
- Sedimentation and Drainage Control Plan
- b) Bruce T.S. Ware - Registered Land Surveyor
Price, Utah
- c) Rollins, Brown, and Gunnell
Provo, Utah
- Foundation Study

- d) Earl Jensen - Soil Scientist
Price, Utah
- e) Roy Harniss - Range Scientist
Logan, Utah
- Vegetation Inventory

B. Coordination and Consultation with Governmental Agencies

The following governmental agencies were consulted in the preparation of information set forth in this application.

U.S. Department of Agriculture
Soil Conservation Service
Price, Utah

U.S. Department of the Interior
Bureau of Land Management
Price, Utah
Salt Lake City, Utah

Office of Surface Mining
Reclamation and Enforcement
Denver, Colorado

U.S. Fish and Wildlife Service
Salt Lake City, Utah

State of Utah:
Department of Natural Resources
Division of Oil, Gas, and Mining
Salt Lake City, Utah

Antiquities Section (Consulting Services
Branch)
Salt Lake City, Utah
(Archaeological Survey)

Department of Natural Resources
Division of Wildlife Resources
Salt Lake City, Utah
Price, Utah

Department of Community & Economic

Development
Division of State History
Salt Lake City, Utah

Department of Natural Resources
Division of Water Rights
Salt Lake City, Utah

Department of Health
Division of Environmental Health
Salt Lake City, Utah

C. References

Andalex Resources, Inc. 1987 - Mining and
Reclamation Plan
Submitted to the State of Utah
Department of Natural Resources, D.O.G.M.

Doelling, H.H. 1972 - Central Utah Coal Fields
U.G.M.S. Monograph Series No. 3

U.S.D.A. 1978 - Soil Survey and Interpretations
of the Coal Creek Emery Portion of the Price
River and Emery County Areas, Carbon and
Emery Counties, Utah. S.C.S.

U.S.D.I. 1979 - Final Environmental Statement,
Development of Coal Resources in Central
Utah, Parts 1 and 2

D. Bibliography

Barfield, B.J., Warner, R.C. and Haan, C.R. 1983.
Applied Hydrology and Sedimentology for Disturbed
Areas. Oklahoma Technical Press, Stillwater, 603
pp.

Cordova, R.M., 1964, "Hydrogeologic Reconnaissance of
Part of Head Waters Area of the Price River,
Utah", Utah Geological and Mineral Survey, Water
Resources Bulletin 4, p. 26.

Fisher, D.J., Erdmann, C.E., and Reeside, J.B., 1960.

"Cretaceous and Testing Formation of the Book
Cliffs, Carbon, Emery, and Grand Counties, Utah,
and Garfield and Mesa Counties, Colorado", U.S.
Geological Survey, Professional Paper 332, p. 80.

Price, D. and Arnow, T., 1974. Summary Appraisals of
the Nation's Ground Water Resources - Upper
Colorado Region. U.S. Geological Survey
Professional Paper 813-C, 40 pp.

Spieker, Edmond M., 1931. Wasatch Coal Field, Utah.
U.S. Geological Survey, Bulletin 819.

U.S. Bureau of Reclamation, 1977. Design of Small
Dams, U.S. Government Printing Office, Washington,
D.C., 816 pp.

Waddell, K.M., and other, 1981. Hydrologic
Reconnaissance of the Wasatch Plateau, Book Cliffs
Field Areas, Utah. U.S.G.S. Water Supply Paper
2068.

R645-301-131.

TECHNICAL DATA REQUIREMENTS

Where applicable, technical data submitted has been identified as
to who prepared the information and is stamped by that registered
professional engineer (P.E.).

R645-301-132.

TECHNICAL ANALYSES REQUIREMENTS

Analyses are prepared by a qualified professional engineer.

R645-301-140.

MAPS AND PLANS

Per Division Requirement.

R645-301-141.

MAP FORMATS

Per Division Requirement.

**PHASES OF OPERATIONS AND MINING
ACTIVITY****Introduction and Overview of Project Permit Application**

This permit application is being submitted by Andalex Resources, Inc., in order that coal can be stored and loaded out of its' coal loadout facility located at Wildcat Junction, near Helper, Utah. This facility is known as the Wildcat Loadout. Andalex is a corporation organized and existing under the laws of the state of Delaware and qualified to do business in Utah. Andalex Resources hereby seeks the permit to operate its' coal loading and storage facility known as Wildcat Loadout, in accordance with the appropriate regulations. This coal loadout facility is located on land owned by the United States of America in Carbon County, Utah.

Andalex was granted the right-of-way in January, 1982, by the Bureau of Land Management of the United States Department of the Interior. *The right-of-way was subsequently amended on February 5, 2007.* Andalex Resources, the designated operator, along with AMCA Coal Leasing, Inc., its' land acquisition and development branch, control all lands within the proposed coal loadout facility area. Andalex Resources, Inc., has therefore prepared this coal loadout facility permit application for submission to the appropriate regulatory authorities for review and approval.

Coal storage and loading activities at Wildcat started officially on April 2, 1985, when the first coal was brought there for storage and eventual loadout, under a permit issued to Andalex Resources by the Bureau of Land Management, U.S. Department of the Interior. This coal loadout facility is located approximately three miles west of U.S. Highway 6, Consumer's Road, Helper, Utah, in Carbon County and can be more accurately described as parts of Section 33, Township 13 South, Range 9 East, S.L.B. & M. (please see Plate 1). The property contains approximately ~~100.19~~ 270 acres, of which 12.5 acres are under lease to the Utah Railway by the Bureau of Land Management. The serial number for this right-of-way is U-48027.

There are no perennial streams or bodies of water on the property. Water for culinary purposes is supplied by Price Municipal Corporation and hauled down to the facility using approved culinary tank trucks. The water is in turn stored in an approved culinary tank at the loadout.

Historically, coal loading activities had been the sole use for this permit area, even prior to being leased to Andalex Resources. This is evidenced by the fact that the soil survey of the area revealed that of the eight test holes, two completely lacked topsoil and one located along the tracks had approximately two feet of fine coal and no topsoil. Coal had been stored along the tracks for shipping purposes in the past. It is appropriately justifiable to conclude that Andalex's proposed use of the area for coal storage and loading activities will be fully compatible with its' previous use, and as such, no significant new disturbance of the area has occurred. Observations have shown that the previous land use consisting of wildlife habitat and migrations has not been interrupted. This is evidenced by repeated sightings of deer herds moving through the permit area. Other mammals and birds continue to use this area for their habitat. Access to the loadout and storage facility is by paved county and state roads, which are also maintained by the county and state.

Coal is hauled from the Centennial Mine, Genwal Resources and West Ridge Mine. All surface and support facilities necessary for present operations have been completed. There are no additions or modifications proposed at this time, *other than those associated with the 2007 Modification Plan described in Appenmdix S.* Aside from the DOGM permit, Andalex Resources has acquired all the necessary approvals, licenses, rights-of-way, and permits at both state and federal levels to conduct coal storage and loading operations on the plan area. The facility is designed to handle loading and crushing activities up to 5.5 million tons per year.

Upon cessation of coal loading activities, reclamation activities will commence in accordance with the plans outlined in this application. The land will be restored to a condition equal to or better than the premining condition, according to available technology.

This facility is located in an area where mining and its' related activities have been the main industry, and as a result, the surrounding communities are properly adapted. The labor supply is excellent and well trained. With all these considerations, coupled with the prudent management at Andalex, the Wildcat Coal Loadout Facility is a model operation in the Carbon County area with no significant environmental or socioeconomic impact.

R645-301-142.100. PRIOR TO AUGUST 3, 1977

None by Andalex Resources. A wash plant and loadout were operated by other independent companies or individuals in areas presently consumed by Andalex's surface facilities. Andalex's encroachment onto these previously disturbed areas transferred the responsibility for reclamation to Andalex. The specific locations of disturbed areas prior to Andalex's mining activities is irrelevant.

R645-301-142.200. AFTER AUGUST 3, 1977

All of Andalex's surface facilities and mining operations began after August 3, 1977.

R645-301-142.210. PRIOR TO MAY 3, 1978

See R645-301-142.100.

**R645-301-142.220. SMALL OPERATOR'S EXEMPTION PRIOR
TO JANUARY 1, 1979**

N/A

**R645-301-142.300. AFTER MAY 3, 1978 (OR JANUARY 1,
1979 FOR SMALL OPERATOR'S
EXEMPTION) AND PRIOR TO APPROVAL
OF STATE PROGRAM**

N/A

R645-301-142.400.

**AFTER ISSUANCE OF PERMIT BY THE
DIVISION**

A list of all applicable permits is included in Appendix B.

R645-301-150.

COMPLETENESS

Per Division.

CHAPTER 2

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CHAPTER 2, SOILS

NOTE TO REVIEWERS: The Wildcat MRP was recently re-formatted to the newer R645 regulations. This reformatted MRP was recently approved and incorporated on May 17, 2006. The current amendment is referred to as the 2007 Modification Plan and consists of three components, namely; 1) addressing Division Order DO-04 regarding wind-blown fines, 2) expanding the primary coal storage pad by about 3.5 acres, and 3) provide for a new material storage area of about 6 acres located on the west side of the facility.

Because the Wildcat MRP was recently reformatted and approved, every effort has been made in this amendment to minimize text changes, as pertains to responses to specific regulations, except where necessary to avoid inconsistencies and contradictions. Where possible, response to individual regulations regarding the proposed 2007 Modification Plan amendment have been made by referring the reviewer directly to Appendix S. This appendix contains a detailed description of the amendment and is presented in a narrative that integrates the various components which are normally addressed in the separate chapters. Within the chapters themselves, all new discussion relevant to the 2007 Modification Plan amendment is presented in italics to easily differentiate it from the previously approved and reformatted text. The submittal also utilizes the standard "redline/strike-out" to aid in the review

R645-301-200. SOILS

- I. Soil Survey and Vegetation Inventory (please see Appendix D and Appendix I).

1. Introduction

Appendix D is a survey conducted by the SCS in the Wildcat area and depicts the major soil types here. Appendix D also includes a survey including sampling as performed by Earl Jensen consulting as a soil scientist. Included in this survey is a soil profile description for each soil type identified on the permit area. Plate 11 depicts the soils as outlined by the Order 3 Survey performed by the SCS.

2. NOTE: Refer to Appendix S for information about

the soils surveys and vegetation inventories associated with the 2007 Modification Plan

R645-301-211. PREMINING SOIL RESOURCES

The entire disturbed area, with the exception of approximately 20 acres, was disturbed pre-law by previous owners, and no topsoil was saved.

Topsoil was removed prior to construction in 1984, and stored and protected for use in final reclamation. Please see Plate 13C for a summary of stored topsoil. Appendix D also includes a topsoil mass balance and includes soil quality data from the Utah State University Testing Laboratory. The mass balance indicates that there may not be sufficient volume of topsoil for final reclamation. Andalex has committed to identifying and testing for suitable substitute material either off the permit area or possibly within the permit area if a suitable growth medium can be identified.

NOTE: Refer to Appendix S for information about the topsoil mass balance associated with the 2007 Modification Plan. This revised plan demonstrates that there should be sufficient topsoil stockpiled for final reclamation after construction is completed.

R645-301-212. STOCKPILING AND REDISTRIBUTION

Removal and Storage of Topsoil and Subsoils

(Also the following sections: R645-301-230, 231.100, 231.400, 232, 234, 251 and 252)

The area from which topsoil was removed is approximately 20 acres (the surface area which was not previously impacted by loading operations prior to Andalex) and includes poorly developed soils. Using scrapers, the soil was scraped from the surface to a depth of approximately six inches and dumped at separate sites on the site. The topsoil storage areas are shown on Plate 1. No topsoil was gathered from ASCA portions of the permit area including the topsoil stockpile on the west side

north of Pond F. All topsoil piles are to be considered ASCA exemptions (see Plate 2). This part of the permit area is where the topsoil piles were placed. Although soil studies indicate suitable material to a depth greater than six inches, Andalex needed to use this subsoil material for fill in the construction of their surface facilities. It should be noted that in several areas on the facility where excavations were made, piles of coal fines were uncovered in some cases up to six feet thick. This material was reclaimed and used as a base for Andalex's coal storage piles. However, no topsoil was available in these areas. The topsoil was removed as a separate operation from areas to be disturbed by surface installations, such as roads and areas upon which support facilities are sited. Topsoil has been segregated, stockpiled, and protected from wind and water erosion and contaminants through revegetation and the use of ditches. All topsoil piles are equipped with impermeable earthen berms. If over a period of time these berms become backfilled with soil as a result of minor erosion, Andalex will remove the material and place it back on the pile thereby maintaining the berm protection at all times. Likewise, substitute topsoil sites, once identified, will be protected with vegetation. Samples were taken of all the topsoil piles to determine whether the material which was gathered is suitable for final reclamation. This analysis is included in Appendix D. Andalex is willing to commit to any necessary steps to insure that the topsoil material is suitable for final reclamation such as the use of additives, fertilizer, etc. Andalex suggests that the topsoil be tested prior to final reclamation as conditions in the piles may change over the next fifteen to twenty years. Parameters that are being analyzed are pH, Ec, saturation percent, texture, organic C, SAR, Total N, available P, percent CaCO_3 , Selenium, and Boron. Disturbed areas no longer required for the conduct of mining operations have been graded and revegetated. Once the topsoil was removed, the areas were graded to accommodate the surface facilities. Andalex submitted plans to modify the disturbed area boundary and to increase the capacity of the Wildcat Loadout. This proposal

included plans to relocate three of the topsoil piles on the east side of the permit area. These topsoil piles (B, C, D) have been moved to the west side of Wildcat where they are protected from additional wind-carried coal fines. The new pile has been renamed Topsoil Pile "B". After these piles were relocated, they also were reseeded once again with an interim seed mixture which will provide further protection from erosion. For further information about topsoil, please see Appendix D.

There are presently 4 topsoil stockpiles on this site.

<u>Topsoil Pile Summary, Existing</u>	
Topsoil Pile A	11,877 ft. ³
Topsoil Pile B	285,810 ft. ³
Topsoil Pile E	122,176 ft. ³
Topsoil Pile F	<u>44,363 ft.³</u>
Total	464,499 ft. ³ (17,204 CY)

Topsoil piles B, C and D have been moved away from the coal storage piles to the west side of Wildcat where they will no longer be subjected to wind-borne coal fines (Existing Topsoil Pile "B"). These piles represent a total volume of 285,770 ft³. The new topsoil pile is a long, narrow pile situated adjacent to the existing topsoil pile on the west side. The new pile is approximately 10 feet in height, 75 feet wide and 500 feet long. Slopes on the topsoil pile do not exceed 2V:1H. A containment berm has been constructed around the perimeter of the pile to a minimum height of two feet. Surface area and surface roughness have been maximized to allow microbial activity and organic matter cycling. The new topsoil pile, was reseeded between October 1 and October 14, 1994, broadcasting the following pure live seed mixture or drill seeding at half the specified rate.

Fairway crested wheatgrass	4 lb/ac
Bozoisky Russian wildrye	4 lb/ac
Arriba Western wheatgrass	4 lb/ac
Nezpar Indian ricegrass	4 lb/ac
Critana thickspike wheatgrass	4 lb/ac

Forage Kochia	4 lb/ac
Rincon Fourwing saltbush	4 lb/ac
Shadscale	2 lb/ac
Gordon Creek Wyoming sagebrush	.5 lb/ac
Castle Valley Gardner saltbush	2 lb/ac

Areas where topsoil has been moved will be drill seeded with the approved mixtures or hand broadcast at 1-1/2 times the specified rate. Andalex proposes the use of several techniques in order to measure revegetation success. These will include the use of non-weedy alfalfa mulch at the rate of three to four tons per acre as well as excelsior matting and chicken wire for erosion control. Mulch will be crimped in on the topsoil pile and in the areas previously designated as undisturbed a light application of water will be applied immediately after seeding. It should be noted that prior to revegetation of the areas previously designated as undisturbed coal fines were vacuumed to the extent possible. Also, if deemed necessary in future years, coal fines will be vacuumed in areas where revegetation could potentially be affected adversely.

It should be noted that areas from which topsoil piles were removed and on the area where fill material was borrowed additional topsoil was gathered to a depth of twelve inches and placed on the new topsoil storage pile on the west side.

NOTE: Refer to Appendix S for information about the removal and storage of topsoil associated with the 2007 Modification Plan. This revised plan demonstrates that there should be sufficient topsoil stockpiled for final reclamation after construction is completed.

Backfilling, Grading, and Soil Replacement and Stabilization (Also R645-301-232.400)

All disturbed areas will be backfilled and graded to as near as possible the approximate original contour with the exception of the natural drainage which came through the loadout site prior to Swisher Coal Company's establishment of their loadout facility. Andalex has diverted this

natural drainage and will provide permanent protection of this diversion once reclamation is complete. Please refer to ~~Chapter 5~~ Appendix R, re Undisturbed Diversions for more detail. Slopes shall not exceed the angle of repose or such lesser slopes as required by the regulatory authority to maintain stability. Fill material will be compacted to assure stability. This is a flat lying area and therefore stabilization should be achieved easily.

Areas which will be backfilled include foundation areas such as the loadout, the reclaim tunnels (including the expanded reclaim system), and the truck dumps. All backfilled and regraded areas, including the Wildcat Expansion areas, will be reclaimed. Areas to be regraded include the loadout site, stockpile sites, and roads. These areas can all be regraded simultaneously because of the simple topography of the area. Where possible, all final grading and placement of topsoil will be done along the contour to minimize erosion.

In all cases, grading will be conducted in a manner which minimizes erosion and provides a stable surface for the placement of topsoils.

Upon reclamation, topsoil will be hauled to the area by end dump trucks, piled and spread using a grader. Where possible, the soil will be distributed along the contour. The thickness of the re-established soil will be consistent with soils in the vicinity and will be sufficient to support vegetation equal to or superior to pre-mining history. As previously mentioned, Andalex was unable to gather topsoil because of the previous disturbance. However, Andalex has committed to identifying and testing topsoil substitute areas either within or outside of the permit area as needed so that upon final reclamation, the entire disturbed area of approximately ~~60.94~~ 75.33 acres can be resurfaced with six inches of topsoil or less if allowed by the Division (please see Plate 1 for the location of these topsoil substitute areas. They are identified on Plate 1 as revegetation test plots.) Existing topsoil piles on site total approximately

464,499 cubic feet (17,204 cubic yards) of material. Andalex feels and it is apparent from the soils inventory, that much of the fill material used onsite could be used as topsoil substitute. As previously mentioned, four topsoil substitute areas have been identified and are shown on Plate 1. Soil samples from these locations have been analyzed and the results are included in Appendix N. Once it has been determined that the substitute material is suitable for reclamation purposes, the actual area of substitute material will be carefully outlined on Plate 1 and the volumes included in the Topsoil Pile Summary. These areas have been protected from wind and water erosion through revegetation using the currently approved seed mixture. Please refer to Appendix D for the specific methods for this revegetation and monitoring. Revegetation of all existing topsoil piles will be accomplished in the same manner as the substitute piles (revegetation test areas). The only area which will not be subject to topsoil redistribution will be the ASCA's, where topsoil was not stripped, the Utah Railway tracks, the Permanent Impoundment, and Diversion UD-1.

It should be noted that when rills or gullies deeper than nine inches form in areas that have been regraded or topsoiled, the rills and gullies will be filled, graded, or otherwise stabilized and the area reseeded or replanted. Rills and gullies of lessor size will be stabilized and the area reseeded or replanted if the rills or gullies are disruptive to the approved postmining land use or result in additional erosion and sedimentation.

At any time a slide occurs which may have a potential adverse effect on public, property, health, safety, or the environment, Andalex Resources shall notify the Division by the fastest available means and comply with any remedial measures required by the Division.

NOTE: Refer to Appendix S for information about the topsoil replacement associated with the 2007 Modification Plan. This revised plan demonstrates that there should be sufficient topsoil stockpiled for final reclamation after construction is completed.

R645-301-220. ENVIRONMENTAL DESCRIPTION

Appendix D

R645-301-221. PRIME FARMLAND INVESTIGATION

Appendix D

R645-301-222. SOIL SURVEY

Appendix D

NOTE: Refer to Appendix S for information about the topsoil surveys associated with the 2007 Modification Plan.

R645-301-222.100. SOIL MAP

Plate 11

R645-301-222.200. SOIL IDENTIFICATION

Appendix D

NOTE: Refer to Appendix S for information about the soil identification associated with the 2007 Modification Plan.

R645-301-222.300. SOIL DESCRIPTION

Appendix D

R645-301-222.400. SOIL PRODUCTIVITY

Appendix D

R645-301-223. SOIL CHARACTERIZATION

Appendix D

R645-301-224. SUBSTITUTE TOPSOIL

(Also the following: R645-301-231.200, 231.300, 232.720 and 233)

Andalex has identified four different locations within the permit area to be used for revegetation test plots. These areas are all located on slopes of fill material created during the construction of the site. The object of these test areas is to determine whether or not all of the fill material within the permit area may be used as substitute topsoil for final reclamation purposes. The test plot locations are shown on Plate 1 designated A, B, C & D, and are located in such a fashion so as to cover the various types of fill material throughout the entire permit area. It is doubtful that the different fill areas vary with respect to chemical constituents or reclamability; however, the revegetation test plots will prove or disprove this theory. It is Andalex's goal to demonstrate that any of the fill material may be used as topsoil substitute and thereby mitigating the shortfall of topsoil gathered due to previous disturbance on site. Based on the area to be reclaimed versus the volume of topsoil currently gathered and in piles, Andalex requires that an additional 31,954 cubic yards of substitute material be identified.

These four locations were treated according to discussions and commitments between Andalex and the Division in the fall of 1989. The treatment included fertilizing, tilling, mulching (weedless alfalfa hay) and seeding. Andalex agreed to quantitatively analyze these areas after two growing years and conducted the survey in the summer of 1992 and 1993. The results of the survey are found in Appendix N. Andalex will perform one more quantitative test on these plots in the summer of 2006. Andalex recommends that the consultant performing the survey be asked for an opinion as well. These techniques may include different bed preparation; using native, local seed; and different fertilizing techniques, including no fertilizer.

In the unlikely event it is determined that the fill material is not suitable for topsoil substitute, Andalex will commit to further discussing solutions with the Division, or locating offsite topsoil substitute material. This will

have to be accomplished in conjunction with a new Bureau of Land Management right-of-way issued for this purpose; therefore, it is hoped that the fill material proves suitable.

In addition to these revegetation test plots, in 1994, Andalex created four new test plots on the surface of the new topsoil storage piles located on the west side of the tracks adjacent to existing topsoil pile E.

These test plots will be approximately 40 feet square and will not be situated on any of the slopes of the topsoil pile. All four test plots will have a roughened surface (roughened meaning troughs and hills between one and four feet in height). Also, all four test plots, along with the remainder of the surface of the topsoil pile will be mulched and have incorporated one ton of weed-free alfalfa hay per acre (the alfalfa will be tested by the Utah State University Agricultural Extension Service). The seed mixture to be used on all of the test plots, as well of the remainder of the topsoil pile is listed on Page 2-4 of this Plan. Seeding will occur no later than October 14, 1994. Seeding will be by hand-broadcasting and will not be raked if the surface is in a loose condition and not crusted.

Test Plot 1 - Test Plot 1 will not be irrigated; it will be mulched with three to four-tons-per-acre of alfalfa hay in an effort to retain natural moisture. The alfalfa hay will be incorporated into the surface so as not to attract deer.

Test Plot 2 - Test Plot 2 will be irrigated. Irrigation will be accomplished through the use of soaker hoses or fine-mist spray according to the following schedule:

In terms of inches of water, the initial profile wetting will be one inch which will occur in the Spring of 1995, approximately April 1. Irrigation will proceed at the rate of one inch every four days for four to six weeks (assuming lack of natural precipitation). Following this, the plot will be irrigated with one inch of water every two

weeks until the end of the season, approximately mid-September, 1995. In addition, Test Plot 2 will be covered with North American Green Straw matting, which will be stapled adequately to the surface. The matting which is planned for use will have netting on one side only.

Test Plot 3 - Test Plot 3 will be irrigated in the same fashion of Test Plot 2. In addition, Test Plot 3 will have 1.5 tons-per-acre straw applied and achored with biodegradable netting.

Test Plot 4 - Test Plot 4 will not be irrigated. In addition to the one-ton-per-acre alfalfa mulch this test plot will be covered with 1.5 tons-per-acre oat or barley straw. This straw will also be covered with a biodegradable mesh which will be stapled to the surface.

It should be noted these test plots were last monitored in 1997, and at that time, showed that they can be revegetated. No further monitoring of these test plots is proposed.

NOTE: Refer to Appendix S for information about substitute topsoil associated with the 2007 Modification Plan. This revised plan demonstrates that there should be sufficient topsoil stockpiled for final reclamation after construction is completed.

R645-301-230. OPERATION PLAN

See R645-301-212

R645-301-231. GENERAL REQUIREMENTS

NOTE: Refer to Appendix S for information about topsoil removal, testing, handling, segregation, quality, and storage associated with the 2007 Modification Plan.

R645-301-231.100. REMOVAL AND STORAGE

See R645-301-212

R645-301-231.200. SUITABILITY OF TOPSOIL SUBSTITUTES

See R645-301-224

R645-301-231.300. TESTING PLAN

See R645-301-224

R645-301-231.400. TOPSOIL HANDLING AND STORAGE AREAS

See R645-301-212

R645-301-232. TOPSOIL AND SUBSOIL REMOVAL

See R645-301-212

R645-301-232.100. TOPSOIL SEGREGATION

See R645-301-212

R645-301-232.200. INSUFFICIENT QUANTITY OR POOR QUALITY

See R645-301-224

R645-301-232.300. TOPSOIL LESS THAN SIX INCHES THICK

N/A

**R645-301-232.400. TOPSOIL REMOVAL FOR MINOR
DISTURBANCES**

N/A

R645-301-232.410. SMALL STRUCTURES

N/A

**R645-301-232.420. PROTECTION OF EXISTING VEGETATION
AND EROSION PROTECTION**

See R645-301-212

R645-301-232.500. SUBSOIL SEGRETATION

N/A

R645-301-232.600. TIMING

All post-law disturbed area soils have been removed and stockpiled. There are no plans to disturb additional areas at this time.

NOTE: Refer to Appendix S for information about the additional disturbance associated with the 2007 Modification Plan. Implementation of this plan (i.e., construction) is proposed for the summer of 2007.

**R645-301-232.700. TOPSOIL AND SUBSOIL REMOVAL UNDER
ADVERSE CONDITIONS**

N/A

R645-301-232.710. IMPRACTICABILITY

N/A

R645-301-232.720. IMPORTING TOPSOIL MATERIAL

See R645-301-224

R645-301-233. TOPSOIL SUBSTITUTES AND SUPPLEMENTS

See R645-301-224

R645-301-233.100. SELECTED OVERBURDEN MATERIALS

See R645-301-224

**R645-301-233.200. SUITABILITY OF TOPSOIL SUBSTITUTES
AND SUPPLEMENTS**

See R645-301-224

R645-301-233.300. PHYSICAL AND CHEMICAL ANALYSES

Appendices D and N.

NOTE: Refer to Appendix S for information on the physical and chemical analyses of topsoil associated with the 2007 Modification Plan.

R645-301-233.310. SCS PUBLISHED DATA

Appendix D

R645-301-233.320. SCS TECHNICAL GUIDES

Appendix D

R645-301-233.330. OTHER PUBLISHED DATA

Appendix D

**R645-301-233.340. RESULTS OF FIELD SITE TRIALS OR
GREENHOUSE TESTS**

See R645-301-212 and Appendix N.

**R645-301-233.400. DEMONSTRATION OF INSUFFICIENT
TOPSOIL AND SUITABILITY OF
SUBSTITUTE MATERIALS**

See R645-301-224

R645-301-234. TOPSOIL STORAGE

See R645-301-212

R645-301-234.100. STOCKPILING AND REDISTRIBUTION

See R645-301-212

R645-301-234.200. STOCKPILING REQUIREMENTS

See R645-301-212

R645-301-234.210. PLACEMENT

See R645-301-212 and Plate I

R645-301-234.220. PROTECTION

See R645-301-212

R645-301-234.230. VEGETATIVE COVER

See R645-301-212

R645-301-234.240. REHANDLING

See R645-301-212

R645-301-234.300. LONG-TERM STORAGE AND DISTRIBUTION

See R645-301-212

R645-301-234.310. CAPABILITY OF HOST SITE

See R645-301-212

R645-301-234.320.

SUITABILITY FOR REDISTRIBUTION

See R645-301-212 and R645-301-224

R645-301-240.

RECLAMATION PLAN

Timetable for Major Reclamation Steps

Introduction

NOTE: The presently approved reclamation plan for the Wildcat Loadout (as of May 17, 2007) involves two phases. Essentially the plan calls for performing nearly all the reclamation in Phase I, except for leaving in several sediment ponds until re-vegetation standards have been met, then removing the remaining ponds in Phase II, and then seeking bond release after the reclaimed pond areas have met the re-vegetation standards. This is the plan that was originally adopted when the Mining and Reclamation Plan was initially approved in 1989. Since that time there has been an accumulated history of mine reclamation involving the numerous central Utah coal operations. Based on that intervening experience the prevailing view of reclamation is that Phase II (i.e., retaining the sediment ponds as the final stage of reclamation) is perhaps counter-productive, and that better results are usually obtained by roughening the reclaimed surface to provide post-reclamation sediment control rather than utilizing the left-over ponds. This is especially true in areas such as Wildcat which are essentially flat and erosion is generally not much of a concern, and where there are no significant drainages running through the area to be reclaimed. Therefore, as part of the 2007 Modification Plan, Andalex proposes to modify the reclamation plan by eliminating the Phase II concept. The following description of the reclamation plan is the same as the approved version in every respect other than elimination of the Phase II "retained sediment pond" concept.

Reclamation will be uncomplicated since this area is flat lying and topographically simple. All disturbed areas no longer required for the conduct of operations were immediately revegetated. In the future, any areas no longer required for operations will also be immediately revegetated.

When buildings and final site preparation was completed, the topsoil was revegetated to prevent erosion.

When the project is expired, perhaps in 30 years, extraneous material will be removed. Roads will be regraded and using the most advanced technology at the time, Andalex will re-establish the terrain to as nearly the original as practical.

Reclamation Timetable

~~Reclamation will be accomplished in two phases. Phase I will commence immediately after the project has expired. Phase I involves the majority of the reclamation steps. It will bring the site to nearly complete with the exception of sedimentation ponds which will be left in place until revegetation has been determined complete. Prior to revegetation being complete, there is a possibility for runoff within the disturbed area to accumulate a sediment load. These ponds left in place will prevent this runoff from leaving the disturbed area. Once the vegetation has been established which will probably take a minimum of two years, Phase II of the reclamation will commence. This phase involves the removal of the four sediment ponds which were left, regrading, and revegetating these areas, and finally, Andalex's commitment to monitoring.~~

Phase I

The first step will be to remove structures. Since none of the structures will remain on site, this will be the largest part of the ~~Phase I~~ effort and will also be the most expensive. The following is a list of structures which will be brought down and removed either complete or as scrap/salvage.

1. 14 x 60 Scale House Trailer
2. Truck Scales
3. Substation

4. Truck Dump (west side)*
 5. Crushing Plant (west side)*
 6. Radial Stacker (west side)*
 7. Reclaim Tunnel (west side)
 8. Loadout Conveyor (west side)*
 9. Control Building (west side)
 10. Truck Dump & Reclaim (2 each)
 11. Conveyor T
 12. Crusher and Screening Plant
 13. Lump Coal Belt
 14. Stoker Radial Stacker
 15. Conveyor Y, Y-1
 16. Main Radial Stacker (2 each)
 17. Loadout Reclaim Tunnel, port supports, hoppers
 18. Conveyor R
 19. Loadout Tower
 20. Miscellaneous (Guard Rails, Office, Water Tanks, Motor Control Centers)
 21. Powerline
 22. 40' x 40' Shop Building and foundation
- * Portable

The next step will be to remove any coal remaining on the various storage areas. This will not amount to a large volume of material and it will either be hauled to an approved storage area off-site or it will be disposed of within the loadout permit area by burial. This will include the coal refuse pile currently stored at Wildcat. The refuse pile will be flattened and buried according to the reclamation plan regarding coal mine refuse (Chapter 5).

Once the coal has been removed, then the recontouring and regrading portion will commence. It is anticipated that the structure removal will take approximately one year to complete so at this point, we would be into the reclamation about thirteen months. The first step in the recontouring and regrading would be the removal of the culverts. They have been left in until this point so the disturbed area would drain properly. The recontouring would primarily involve the primary and secondary roads, the loadout pad, and the coal stockpile areas. The undisturbed diversion west of the facility would become permanent at this point and would be capable of passing a 100 year precipitation event. The original natural drainage could not be restored because of the Utah Railroad. This natural drainage has been either blocked or diverted for the last 30 years by predecessors to Andalex.

As part of the 2007 Modification Plan, Andalex Resources acquired aerial photography and digital mapping of the Wildcat Loadout Area. From this photography and mapping Andalex has been able to represent the site with topography on 2' contours. This mapping represents the "as-built" facility as of the spring of 2007. This topographic mapping is far more accurate than the original mapping upon which the presently approved MRP is based, which now consists of hand copied ink mylars. The new digital mapping is computer-generated and utilizes X-Y-Z co-ordinates. This electronic mapping is ideal for determining comparative earthwork volumes, since new computer programs are capable of taking existing and proposed contour of the same area and accurately computing cut and fill volumes. This is more accurate than the older methods of determining volumes off of widely-spaced cross sections. Therefore, the 2007 Modification Plan amendment proposes to use this new method of computer-generated volumes for the purpose of determining earthwork volumes for final reclamation. Plate 9 is a revised reclamation map, which shows approximately 80,000 cubic yards of material will have to be moved in the process of recontouring and grading. This would replace the previous Mass Balance Summary with more current numbers reflecting the existing "as-built" site configuration versus the final reclamation configuration.

~~It is estimated by the cross sections that approximately 74,000??? cubic yards of material will have to be moved in this process of recontouring and grading (please see Tables II-1 and II-1A re Mass Balance Summary). This part of Phase I will include the removal of all ponds. B and E and establishing new drainages to Ponds A, C, and D. Recontouring will take one month.~~

TABLE II-1

Mass Balance Summary

	Cut	Fill
1 + 00	740.8	926.0
0 + 00	1,111.2	
1 + 00	3,333.6	
2 + 00	1,481.6	2,963.2
3 + 00	1,852.0	5,185.6
4 + 00		5,926.4
5 + 00	1,111.2	4,074.4
6 + 00		4,444.8
7 + 00		1,481.6
8 + 00	7,037.6	4,444.8
9 + 00	6,667.2	2,963.2
10 + 00	7,037.6	2,222.4
11 + 00	4,444.8	2,963.2
12 + 00	8,519.2	4,444.8
13 + 00	1,481.6	6,296.8
14 + 00		8,148.8
15 + 00	7,408.0	4,444.8
16 + 00	6,667.2	3,704.0
17 + 00	2,222.4	5,185.6
18 + 00	5,926.4	2,222.4
19 + 00	1,481.6	1,852.0
20 + 00		740.8
21 + 00	5,185.6	
-		
Total	73,709.6	74,635.6

Note: Refer to Plate 14 for cross section locations.

TABLE II-1A

Mass Balance
Expanded Wildcat Pad Cross Sections

	Cut	Fill
0+00 - 0+60	0	0
0+80	24.0	0
1+00	22.9	0
1+20	26.1	0
1+40	24.5	0
1+60	58.7	0
1+80 - 3+80	0	0
4+00	0	78.4
4+20	0	250.4
4+40	0	302.3
4+60	181.0	301.3
4+80	157.2	310.1
5+00	139.9	273.5
5+20	132.4	272.7
5+40	135.5	271.7
5+60	153.2	251.3
5+80	169.7	204.9
6+00	171.4	194.7
6+20	173.5	148.0
6+40	185.7	109.3
6+60	227.3	88.4
6+80	234.7	35.0
7+00	211.9	17.0
7+20	0	0
Totals	2,429.6	3,109.0
x 20% swell =	485.9	
	2,915.5	

Note: Refer to Plate 14 for cross section locations.

At the request of the Division, no extraordinary compaction will be applied to the last few lifts during the recontouring/grading, to provide a relatively loose rooting zone of four feet. This loose application of fill will eliminate the need for ripping prior to topsoil placement. During this operation, if it is determined that additional sediment control measures are needed for the diversions leading to the four ponds, they will be put in at this time. These measures might include rock check dams or straw dikes.

The next steps ~~in Phase I~~ will not take place until the fall of whatever year we are in at this point. So far the project has taken 14 to 15 months. The next two steps in the process are topsoil redistribution, where additional substitute will be hauled in if necessary, and revegetation. Once the topsoil is spread, the area will be roughened by gouging, and the area will be hydroseeded and hydromulched. The entire revegetation procedure is described in this chapter.

Finally ~~in Phase I~~, monitoring will commence. Observations of revegetation success and slope stability will be observed. If any part of this is unsuccessful, corrective measures will be taken.

Since Andalex estimates a minimum of two years before vegetation has taken hold to prevent erosion, then the entire ~~Phase I~~ project will take at least 3-1/2 years.

Phase II

~~Phase II of the reclamation will commence as soon as the monitoring of Phase I allows.~~

~~All that is left at this point is the removal (recontouring) of Ponds A, C, D, and F and the removal of the field fence surrounding the permit area. Once the areas have been graded, they will be prepared with loose filling of the upper lifts, (as described in Phase I above), prior to topsoil redistribution. At this point, if it is not already the fall season, Andalex will wait before redistributing the topsoil and revegetating. The same methods for revegetation will be used as in the~~

Phase I reclamation.

Monitoring will then continue until the release of the bond.

Please note that earthwork will be done ~~in both Phase I and II~~ as much as possible during the dry seasons to avoid unnecessary erosion to the regraded areas. If dust becomes a problem, water will be used to control it.

Reclamation Cost and Bonding

A description of reclamation is provided in R645-301-542.400. Bond information and detailed costs are provided in Appendix B.

Soil Testing Plan and Soil Preparation

Where possible the soil will be distributed along the contour. Soil will be redistributed using dump trucks and graders. The thickness of the re-established soil will be consistent with the pre-mining conditions. As this facility was previously impacted by other loading operations, Andalex was unable to gather topsoil on these areas. This will require the use of topsoil substitute material for final reclamation. Andalex has chosen potential topsoil substitute material and is currently in the process of performing the necessary tests and monitoring to demonstrate that it is suitable (page 51). Twenty samples of potential substitute topsoil material have been sent to the Utah State University Soils Lab. There are four test plot locations, A through D (Plate 1), and samples at each location have been taken from 0-6", 6-12", 1-2', 2-3', & 3-4'. Samples will be taken from the new test area west of the railroad tracks at these same depths. All test plots, including the newest plot will be analyzed for: soil color, texture, pH, organic carbon, saturation percentage, alkalinity, electrical conductivity, calcium carbonate percentage, sodium absorption ratio, soluble potassium, magnesium, calcium, sodium, total nitrogen, available phosphorous, available water capacity, and percent rock fragments. The results can be found in Appendix N. Once any of the areas of substitute material have been determined suitable for reclamation, all or part of these areas will be carefully outlined on Plate 1 and the volumes necessary to make up the current topsoil deficit, will be

included in the Topsoil Pile Summary. This will require approximately 31,954 additional cubic yards of material.

NOTE: Refer to Appendix S for information about the topsoil mass balance associated with the 2007 Modification Plan. This revised plan demonstrates that there should be sufficient topsoil stockpiled for final reclamation after construction is completed.

Prior to final reclamation, samples will be taken of the stored topsoil to determine any deficiencies which would affect the growth of newly revegetated areas. Any deficiencies will be corrected by adding to the soil chemical fertilizers, organic mulch, or any other substances recommended by the regulatory authority. Preparation techniques such as discing will be incorporated.

Species and Amounts of Seeds and Seedlings

A reference area has been established by Andalex and DOGM. The sagebrush/grass reference area was used in combination with a vegetation inventory to determine the final seed mixture and amounts of seed to be used for final reclamation.

The following seed mixture, was developed by Mt. Nebo Scientific in conjunction with the vegetation inventory and UDOGM comments.

Planting and Seeding Methods

All reclaimed areas will be stabilized by gouging prior to reseeding. The gouging will be done with a backhoe or trackhoe, and will consist of gouges at least 18" deep by 24" - 36" wide, spaced 6' - 10' apart. All areas will then be hydroseeded and hydromulched.

Mulching Techniques

Vegetative cover will be promptly re-established following cessation of mining activities to stabilize erosion. Re-seeding will occur during the first normal period for favorable growth following regrading. Mulch will be applied to all reseeded areas. Areas which are hydromulched will be done so using an organic type mulch at the rate of one ton per acre. Where hydroseeding and hydromulching occur, a tackifier will be added to both the seed and the mulch.

Mulch will be used wherever seeds are planted. All disturbed areas will be reseeded. These areas are shown on Plate 9 and constitute 60.94 acres. (Not including the Utah Railway tracks).

Wildcat Loadout Final Seed Mixture			
Scientific Name	Common Name	PLS/A	Seeds Per
<i>Amelanchier utahensis</i>	Utah serviceberry	7.00	4.15
<i>Artemisia tridentata</i>	Big sagebrush	0.06	3.44
<i>Ceratoides lanata</i>	Winterfat	5.00	6.31
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush	0.30	2.75
<i>Purshia tridentata</i>	Bitterbrush	12.00	4.13
<i>Archillea millefolium</i>	Yarrow	0.05	3.18
<i>Hedysatum boreale</i>	Northern sweetvetch	8.00	6.17
<i>Linum lewisii</i>	Lewis flax	1.00	6.38
<i>Penstemon palmeri</i>	Palmer penstemon	0.50	7.00
<i>Viguiera multiflora</i>	Showy goldeneye	0.20	4.84
<i>Bouteloua gracilis</i>	Blue grama	0.60	9.79
<i>Elymus spicatus</i>	Bluebunch wheatgrass	2.50	8.03
<i>Elymus trachycaulus</i>	Slender wheatgrass	2.50	9.18
<i>Hilaria jamesii</i>	Galleta	2.50	9.13
<i>Stipa comata</i>	Needle-and-thread	3.00	7.92
<i>Stipa hymenoides</i>	Indian ricegrass	2.00	8.63
TOTALS		47.21	101.06

Wildcat Loadout Interim Seed Mixture			
Scientific Name	Common Name	PLS/A	Seeds Per
<i>Archillea millefolium</i>	Yarrow	0.30	19.08
<i>Elymus lanceolatus</i>	Thickspike Wheatgrass	8.00	28.28
<i>Elymus smithii</i>	Western Wheatgrass	9.00	26.03
<i>Elymus stachycaulus</i>	Slender Wheatgrass	8.00	29.38
TOTALS		26.30	102.78

Management Practices, e.g., Irrigation, Pest,
and Disease Control

No mechanical irrigation will be used because of the lack of water in the area. Vegetative growth will be subject to normal rainfall and winter snowfall. Vegetation will be protected from both wildlife and livestock by drift-fences until the reclaimed areas have been adequately re-established. Upon approval, the fences will be removed. Fences are already standing surrounding the permit area. Pesticides and herbicides will be used as necessary. Should any persistent pesticides be needed, the Division's approval will be obtained prior to their use.

Measures to Determine Success

Revegetation will be closely monitored. Areas which fail to support sufficient growth to stabilize conditions will be tested and reseeded until a proper cover is established. Physical examinations will be conducted to note any species which are not thriving or regenerating. If this occurs, species will be substituted at the recommendation of the regulatory authority. Any other species will be added at the time of reclamation upon recommendation of the regulatory authority. All reclaimed areas will be monitored and maintained by the constant observation of Andalex until the surety release is granted. This will include slope staking on any sloped areas.

Revegetation monitoring parameters to be measured are growth rate, plant density and percent cover. We would expect to monitor or supervise monitoring at least monthly during the first two growing seasons. From experience with interim revegetation at the minesite, we have learned that two growing seasons are needed to establish any success. After this we would know whether reclamation was progressing successfully.

Andalex is committed to quantitative sampling of reclamation cover, frequency and woody plant density during years 2, 3, 5, 9, and 10. Productivity will be sampled only during years 9 and 10. The reference area will be sampled during years 9 and 10.

R645-301-241.

GENERAL REQUIREMENTS

R645-301-242.**SOIL REDISTRIBUTION**

Topsoil and or substitute topsoil is to be redistributed to a depth of 6-inches (or less as approved by the Division) across the entire ~~60.94~~ 75.33 acre disturbed area, as shown on Plate 9.

R645-301-242.100.**CRITERIA FOR REDISTRIBUTION**

The only criteria is that it will be redistributed to a depth of 6 inches (or a lessor amount as approved by the Division).

R645-301-242.110.**UNIFORMITY AND CONSISTENCY**

The soil will be redistributed uniformly and consistent with the regraded contours.

R645-301-242.120.**PREVENTION OF COMPACTION**

Once redistributed, unnecessary compaction from equipment will be avoided.

R645-301-242.130.**PROTECTION FROM WIND AND WATER EROSION**

The topsoil will be protected from wind and water erosion through mulching and revegetation.

R645-301-242.200.**REGRADEING AND TREATMENT**

Not applicable, unless unacceptable rills and gullies are observed. (See R645-301-212)

R645-301-242.300.**EMBANKMENTS OF PERMANENT IMPOUNDMENTS OR ROADS**

The 2-celled Permanent Impoundment will be left. The embankments are stable and vegetated. Details are discussed in Chapter 7 of this Permit.

R645-301-242.310.**PREVENTION OF SEDIMENTATION**

~~Sediment Ponds A, C, D and F will be left in place until revegetation standards are reached (Phase I).~~

Prevention of sedimentation will be primarily through surface roughening (gouging and pocking) which should be adequate considering the relatively flat nature of the site.

R645-301-242.320. OTHER METHODS OF STABILIZATION

Roughening/gouging will be the primary method of stabilization. Other methods may include mulching and rip-rap.

R645-301-243. SOIL NUTRIENTS AND AMENDMENTS

As needed to be determined through Phase I monitoring.

R645-301-244. SOIL STABILIZATION

See R645-301-242.

R645-301-244.100. EROSION CONTROL AND AIR POLLUTION

See R645-301-242.

R645-301-244.200. SOIL STABILIZING PRACTICES

See R645-301-242.

R645-301-244.300. RILLS AND GULLIES

See R645-301-212 and R645-301-242.

**R645-301-244.310. DISRUPTION OF POSTMINING LAND USE
OR ESTABLISHMENT OF VEGETATIVE
COVER**

Vegetative cover will be in accordance with revegetation practices found in R645-301-331.

**R645-301-244.320. CAUSE OR CONTRIBUTE TO A VIOLATION
OF WATER QUALITY STANDARDS**

Andalex will not violate water quality standards. This will be demonstrated through monitoring practices.

R645-301-250. PERFORMANCE STANDARDS

All performance standards will be adhered to.

R645-301-251. SOIL REMOVAL

See R645-301-212.

R645-301-252.

SOIL STORAGE AND REDISTRIBUTION

See R645-301-212.

CHAPTER 3

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CHAPTER 3, BIOLOGY

NOTE TO REVIEWERS: The Wildcat MRP was recently re-formatted to the newer R645 regulations. This reformatted MRP was recently approved and incorporated on May 17, 2006. The current amendment is referred to as the 2007 Modification Plan and consists of three components, namely; 1) addressing Division Order DO-04 regarding wind-blown fines, 2) expanding the primary coal storage pad by about 3.5 acres, and 3) provide for a new material storage area of about 6 acres located on the west side of the facility.

Because the Wildcat MRP was recently reformatted and approved, every effort has been made in this amendment to minimize text changes, as pertains to responses to specific regulations, except where necessary to avoid inconsistencies and contradictions. Where possible, response to individual regulations regarding the proposed 2007 Modification Plan amendment have been made by referring the reviewer directly to Appendix S. This appendix contains a detailed description of the amendment and is presented in a narrative that integrates the various components which are normally addressed in the separate chapters. Within the chapters themselves, all new discussion relevant to the 2007 Modification Plan amendment is presented in italics to easily differentiate it from the previously approved and reformatted text. The submittal also utilizes the standard "redline/strike-out" to aid in the review

R645-301-300. BIOLOGY

R645-301-310. INTRODUCTION

Vegetation Information

Introduction

An intensive detailed vegetation survey was not required or performed for the BLM Right-of-Way prior to the construction of this facility. It was a sagebrush/grass lowland with a Pinyon-Juniper community to the west. The following letter, shows the two reference areas identified by the SCS which show the general vegetative types in the area. Although the SCS identified these two areas, a third area was chosen by the Division of Oil, Gas, and Mining and Andalex Resources and is shown on Plate 1. A detailed vegetation inventory has been

performed for Andalex by a qualified range scientist on this third reference area and is included in this document as Appendix I. This inventory will be the basis for a seed mixture to be used during reclamation. Please note that although the SCS identified two reference areas, the reference area being used for this MRP was designated by DOGM and Andalex for use during reclamation.

NOTE: Refer to Appendix S for information about vegetation surveys associated with the 2007 Modification Plan.

Description **(Also R645-301-311, 320 and 321)**

Vegetative Types

The vegetative types include Pinyon-Juniper and Sagebrush-Grass. The Loadout Facility was constructed entirely within the Sagebrush-Grass Community. Please see Table III-7. Also refer to Appendix I.

Threatened or Endangered Species

There are no known threatened or endangered species within the permit area and the detailed inventory of the reference area has confirmed this.

Plant Communities **(Also R645-301-323.400)**

The Sagebrush-Grass group is present from 6,200 to 9,000 feet on and in the low benches below the cliffs. Sage and rabbit brush appear associated with the common grasses occurring in other communities such as curly grass, indian rice grass, and bull grass. Fourwing and saltbrush is found on better drained soils. Shad scale and curly grass associations are found on the heavier clay soils.

The Pinyon-Juniper Woodland community occurs in the area from an elevation of 5,600 to 8,000 feet and dominates the area below the excarpment of the Wasatch Plateau. Pinyon pine and Utah juniper are the dominant species with bull grass, indian rice grass, and birch leaf mahogany as associated species.

Identified species of noxious or poisonous weeds in the area are halogeton, cocklebur, loco, and copperweed.

There are no concentrated areas or serious problems from these poisonous plants.

Some of the most important vegetation species are listed in Table III-7. Please see Appendix I for the site specific vegetation inventory.

TABLE III-7

Vegetation Possibly Occurring in Area

<u>Common Name</u>	<u>Scientific Name</u>
<u>Grasses:</u>	
curly grass	Hilaria jamesii
indian rice grass	Oryzopsis hymenoides
squirreltail	Sitanian hystix
needle and thread grass	Stipa commata
no eatum grass	Aristida fendleriana
western wheat grass	Agropyron smithii
bull grass	Elymus salinus
<u>Shrubs:</u>	
nuttal saltbush	Atriplex nuttallii
mat saltbush	Atriplex corrugata
shadscale	Atriplex confertifolia
fourwing saltbush	Atriplex canescens
big sagebrush	Artemisia tridentata
black sagebrush	Artemisia arbuscula nova
greasewood	Sarcobatus vermiculatus
small rabbitbrush	Chrysothamnus viscidiflorus
big rabbitbrush	Chrysothamnus nauseosus
mountain-mahogany	Cercocarpus montanus
serviceberry	Amelanchier alnifolia
curlleaf mahogany	Cercocarpus ledifolius
squaw apple	Peraphyllum ramosissimum
snowberry	Symphoricarpos oreophilus
<u>Trees:</u>	
juniper	Juniperus osteosperma
pinion	Pinus edulis
ponderosa pine	Pinus ponderosa
aspen	Populus tremuloides
limber pine	Pinus flexilis
douglas fir	Pseudotsuga menziesii
gambel oak	Quercus gambelii

Area to be Disturbed

The surface area disturbed is ~~60.94~~ 81.78 acres as shown on Plate 1, 2 and 16. ~~of which approximately 20 acres were disturbed by Andalex.~~ The disturbed area does not include the ASCA's or the Utah Railway tracks. The present surface facilities are located in an area that has been previously impacted by loading activities. Actual plant communities which have been disturbed is the Sage-Grass. Extreme care has been taken to disturb as little vegetation as possible and revegetation has been immediately carried out on all disturbed areas no longer needed for the mining operation.

Fish and Wildlife Resources and Plan **(Also R645-301-342)**

Introduction

The loadout area is located east of the Wasatch Plateau, a region which supports about 360 vertebrate wildlife species. The abundance and distribution of wildlife in the lease area is directly related to present land use activities and capabilities. Use of this area by certain species is limited to lack of perennial water. Wildlife species possibly occurring in the lease area are listed in Table III-8. Please see Appendix F re Wildlife Resources Information.

Source of Data

Department of the Interior, 1979. Final Environmental Statement - Development of Coal Resources in Central Utah, Parts 1 and 2. (Sections 3, 4.0, 4.1, 4.2, 4.3, 4.4, and 4.5)

Andalex Resources (Chapter 3)

Utah Department of Natural Resources, Division of Fish and Wildlife. (Appendix F)

U.S. Department of Interior, Bureau of Land Management (Appendix E)

Habitats

Previously described vegetation provides fair to excellent habitat for a variety of wildlife species. It also provides critically important winter range for deer.

Species (Please see Table III-8)

Mammals

Mammals occurring in the area can be divided into two groups, game species and non-game species.

The main game species include mule deer, mountain lion, black bear, elk, and cottontail rabbits. Mule deer, however, are the most important wildlife resource in the area. Mountain lion are present but little information is available due to their ranging habits. Generally, their movement coincides with the migration of deer. Black bear may occasionally be found in the vegetated canyons, usually along the cliff face. They normally inhabit the Wasatch Plateau to the west but little data is available on their populations. The permit area is not within the limits of the elk range. Cottontail rabbits are distributed throughout the area.

Non-game mammals include several species of small animals inhabiting the area. Predator species such as coyote and bobcat occasionally are found in the area and depend on small rodents and rabbits for their source of food. Information on non-game species is generally unavailable.

TABLE III-8

List of Animals Possibly Occurring in Region

<u>Common Name</u>	<u>Scientific Name</u>
<u>Mammals:</u>	
Badger	Taxidea taxus
Black Bear	Ursus americanus
Bobcat	Lynx rufus
Coyote	Canis latrans
Deer mouse	Peromyscus maniculatus
Desert Cottontail	Sylvilagus audubonni
Elk	Cervus elaphus
Ground Squirrel	Spermophilus tridecelineatus
Least Chipmunk	Eutamias minimus
Mountain Lion	Felis concolor
Mule Deer	Odocoileus hemionus
Porcupine	Erethizon dorsatum
Striped Skunk	Mephitis mephitis
White-tailed Jackrabbit	Lepus townsendii
White-tailed Prairie Dog	Cynomys leucurus
<u>Birds:</u>	
Brewers Sparrow	Spizella breweri
Blue Grouse	Dendragapus obscurus
Common Nighthawk	Chordeiles minor
House Sparrow	Passer Domesticus
Lark Sparrow	Chondestes grammacus
Magpie	Pica pica
Mourning Dove	Zenaidura macroura
Pinyon Jay	Gymnorhinus cyanocephala
Red-tailed Hawk	Buteo jamaicensis
Robin	Turdus migratorius
Ruffed Grouse	Bonasa umbellus
Sage Grouse	Centrocercus urophasianus
Sparrow Hawk	Falco sparverius
Turkey Vulture	Cathartes aura
Vesper Sparrow	Pooecetes gramineus
Great Horned Owl	Bubo Virginianus

Birds

Raptors

The turkey vulture and red-tailed hawk frequent the area. A variety of other raptors breed in the Price area; however, there is a poor density of raptors throughout the plan area. Bald eagles migrate through this area in the winter and a variety of owl species are occasionally observed year round.

Most interestingly, a family of Great Horned Owls successfully nested on top of the loadout structure. A Great Horned Owl had been observed during the winter months flying and roosting near by. Owl eggs were first observed on top of the loadout beneath the conveyor belt in early March. The DWR was contacted immediately and we were instructed to do nothing and continue operations normally. The DWR advised us that once the chicks hatched, they would move them to a nest box which Andalex built and mounted nearby but out of the way. The chicks hatched in mid April and were moved the same day. When the chicks (two) were approximately one month old, they were banded by officers of the DWR. The chicks matured and left the nest in June. The DWR feels that there is a strong possibility that the owls may return in 1989.

Other

Sage grouse inhabit the sagebrush flats at the foot of the cliffs. Blue and ruffed grouse may occasionally be found in the vegetated canyons of the area. Chukars can be found around the cliffs. Mourning doves are generally distributed throughout the area; however, the lack of perennial water limits dove nesting habitat in the area. Other representative birds include the magpie, bluebird, robin, and several species of sparrow.

Reptiles and Amphibians

The most prominent species of reptiles include the rattlesnake and sagebrush lizard. No aquatic fauna are present in the area.

Fish

There are no active fisheries as there are no permanent

bodies of water or perennial streams in the area. No aquatic fauna are found.

Threatened or Endangered Species

There have been no known threatened or endangered species on or near the lease area according to a survey conducted by the Utah Division of Wildlife Resources.

Impacts of Operations

(Also R645-301-333)

Construction of all roads, powerlines, and surface facilities has been completed and loading operations have commenced. Therefore, no additional impact of operations on wildlife is anticipated. Powerlines were constructed according to DWR and USF&W guidelines. It should be noted that this facility has had a good history of co-existing with wildlife in this area. This is constantly observed.

Fish and Wildlife Plan

(Also R645-301-322.210,
333.200 and 358)

The Fish and Wildlife Plan was prepared by the Utah DWR under the direction of Mr. Larry Dalton in 1987 (please see Appendix F). The purpose for this study was to estimate the types and densities of wildlife expected to be found in the area. It was also done to determine whether or not threatened or endangered species existed and whether or not the impacts to wildlife could be mitigated. The environmental assessment performed by the B.L.M. (Appendix E) was performed to estimate the best methods which could be used for the Wildlife Enhancement Project. Part of any grant issued by the B.L.M. includes an environmental assessment. This assessment was put together by the B.L.M. in the summer of 1984.

Andalex has made every possible effort to minimize disturbances to wildlife habitat in the area and where possible will enhance that habitat during reclamation.

Please refer to Appendix F re Fish and Wildlife Resources and Plan. It should be noted that there is no aquatic life in the permit area as this area is dry except as a result of direct precipitation (ephemeral streams). Andalex has performed numerous mitigative measures including extensive revegetation in the area directly mitigating our disturbance. Andalex has performed all

mitigative measures outlined in the Fish and Wildlife Plan (Appendix F) with the exception of the use of swareflex reflectors.

Andalex has advised and encouraged employees to avoid unnecessary disturbances to all wildlife regardless of the season, but especially the depleted winter season or the breeding season. Hunting and all wildlife regulations are adhered to. In corporation with the Division of Wildlife Resources and the College of Eastern Utah, Andalex has incorporated a visual training guide for its employees to be used annually during mine retraining.

During revegetation, Andalex will use seed mixtures which are favorable for wildlife enhancement.

To date, Andalex has had no use for poisons for rodent control or any other persistent pesticide.

Snake dens will be reported to the DWR.

Andalex will report the sitings of any known threatened or endangered species within or in the vicinity of the permit area.

Andalex will commit to reporting any unapproved range or forest fires. Spontaneous combustion in the coal piles occurs from time to time particularly in the winter months. These small smoldering areas in the coal piles are extinguished easily and immediately using a frontend loader. All coal piles are subject to this phenomenon and Andalex is sure that the division would not want each small coal fire reported.

No avifauna will be disturbed within Andalex's minesite and in particular, raptors and their nests. Andalex's powerline was constructed under the guidance of the Utah DWR and USF&W.

Lodges, nests, and dens for all mammals will be protected from disturbance. Andalex has reduced speed limits posted within the permit area to 15 mph. The haulroad year-round is posted at 40 mph. Swareflex reflectors will not be implemented.

There are no unpaved sections of the haul road and

swareflex reflectors are not being used. Andalex has demonstrated mitigation of impacted habitat through revegetation efforts on areas in and outside the permit area. We have had employee wildlife education sessions in the past and may perhaps in the future. The powerline was constructed under strict guidelines and has been thoroughly checked by both the Utah DWR and the U.S. Fish and Wildlife Service. Prior to November 30, 1988, Andalex will provide the 4" gap in the ground wire on all cross-arm type structures from the substation to the loadout.

Please note that as an indication that this facility is not disruptive to wildlife, deer herds are constantly observed moving through the area, drinking from our ponds, and feeding on revegetated areas. Also, small mammals such as prairie dogs have formed towns within the permit area.

Most interestingly, a family of Great Horned Owls have successfully nested on top of the loadout structure.

Should Andalex observe reoccurring problems with respect to wildlife fatalities which potentially could be corrected, Andalex will make every effort to correct these problems.

Please note that a large area of revegetation was undertaken by Andalex to enhance wildlife range thereby mitigating the loss of range through the construction of this facility. The acreage enhanced by Andalex Resources is roughly the same as that acreage disturbed by Andalex for the Wildcat Loadout Facility. Please bear in mind that the majority of the Wildcat Facility had been previously impacted by coal loading operations and railroad operations. Appendix E is a description of the mitigation work performed by Andalex under the direction of the B.L.M. and the Utah D.W.R. Andalex is following all guidelines set forth in the Fish and Wildlife Plan except the use of swareflex reflectors.

Andalex Resources was issued a right-of-way and a temporary land use permit associated with its' Wildcat Loadout Facility. A stipulation to these grants was that Andalex would perform a wildlife enhancement project to

mitigate the loss of critical deer winter range as a result of the construction of the loadout facility. This work was performed under the direction of the Bureau of Land Management and the Division of Wildlife Resources in the fall of 1984. The work consisted of the elimination of undesirable vegetation and replacing it with preferred deer range species. Vegetation was removed with a plow and the seed mixture developed by the Utah DWR was planted using a rangeland drill. Andalex Resources performed this work on an area of approximately 21 acres (Plate 18 outlines the area impacted by Andalex for the Wildcat Loadout. The remaining acreage consumed by the Wildcat Loadout Facility was previously disturbed). Andalex has fulfilled its' obligations under these grants. It should be noted that contemporaneous reclamation as well as sediment pond construction has in itself mitigated impact to deer winter range within the permit area. It should also be noted that the mineral sale borrow area was never used. Please see Appendix E.

During the spring of 1988, Andalex Resources' personnel traveled to the site where wildlife enhancement took place. Areas which were plowed and seed drilled were stepped off and measured in the field and a total of 21 acres was estimated with reasonable accuracy. A direction and chain method was utilized to measure the areas. Plate 18 depicts the areas disturbed by Andalex versus previously disturbed areas. These two areas can be distinguished easily on the aerial photo. Please note that the temporary land use area was one of the previously disturbed areas and as such, Andalex did not destroy any valuable deer winter range. The actual acreage disturbed by Andalex totals ~~24.5~~ 81.79 acres. Andalex would also like to point out that large portions of the disturbed area have been enhanced subsequent to the construction of the facility to create reasonably good wildlife habitat, specifically, deer. This has been accomplished with contemporaneous reclamation of all areas not being utilized within the disturbed area (pond embankments, other slopes, and topsoil storage piles have all been revegetated). Also, it has been observed that the sedimentation ponds create drinking reservoirs for deer. During winter months at the Wildcat facility, deer herds of up to 50 animals have been observed on a frequent basis, grazing and drinking within Andalex's disturbed area. The deer actually congregate within Andalex's disturbed area. None of Andalex's activities

affect the deer herd as far as migration or movement. Deer have been observed even walking beneath unit trains. Therefore, Andalex's facility offers no obstructions to deer movement. Taking all this into consideration, and as a result of an agreement between Andalex and the Utah Division of Wildlife Resources, Andalex has agreed to enhance an additional approximately 15 acres in the near future. Andalex will perform this work in the fall of 1989 in accordance with the UDWR alternative 1.

Water consumption at this site averages approximately 2.48 acre feet per year. Of this amount, approximately 2.16 acre feet is used for dust control and 0.32 acre feet is used for culinary purposes.

**R645-301-311. VEGETATIVE, FISH AND WILDLIFE
RESOURCES**

See R645-301-310.

R645-301-312. POTENTIAL IMPACTS

See R645-301-310 "Area to be Disturbed".

R645-301-313. RESTORATION OR ENHANCEMENT

See Appendix E.

R645-301-320. ENVIRONMENTAL DESCRIPTION

See R645-301-310.

R645-301-321. VEGETATION INFORMATION

See R645-301-310.

**R645-301-321.100. POTENTIAL FOR REESTABLISHING
VEGETATION**

Appendix N

R645-301-321.200. PREMINING PRODUCTIVITY

Not available - Site was disturbed pre-law by another operation.

R645-301-322. FISH AND WILDLIFE INFORMATION

Appendix F; R645-301-310.

R645-301-322.100. PROTECTION AND ENHANCEMENT PLAN

Appendix E & F

R645-301-322.200. SITE-SPECIFIC RESOURCE INFORMATION

Appendix F

R645-301-322.210. THREATENED OR ENDANGERED SPECIES

See R645-301-310.

**R645-301-322.220. HABITATS OF UNUSUALLY HIGH VALUE
FOR FISH AND WILDLIFE**

See R645-301-310.

**R645-301-322.230. OTHER SPECIES OR HABITATS
REQUIRING SPECIAL PROTECTION**

N/A

R645-301-322.300. FISH AND WILDLIFE SERVICE REVIEW

Appendix B - Item 22 (Powerline Approval)

R645-301-323. MAPS AND AERIAL PHOTOGRAPHS

N/A

R645-301-323.100. REFERENCE AREAS

See Plate 1.

R645-301-323.200. MONITORING STATIONS

N/A

R645-301-323.300. ENHANCEMENT FACILITIES

N/A

R645-301-323.400. PLANT COMMUNITIES

See R645-301-310.

R645-301-330. OPERATION PLAN

Maps and Plans

The lands affected by this operation (surface only) are clearly shown on Plate 1. Plate 1 depicts all buildings, utilities, and facilities. All of the land within this permit area which is to be affected already has been. This is a surface facility only and involves no underground workings. The bond required by the Division is for the entire affected area including all the surface facilities.

Coal storage, topsoil storage, loading areas, coal preparation waste areas are all depicted on the surface facilities map. Additional detail on topsoil, diversions, and ponds can be found in Volume II on Plates 1, 1A, and 13A-C.

There is no storage of explosives at the Wildcat Loadout.

The final surface configurations will be similar to the surface prior to Andalex's involvement at Wildcat, as shown on Plate 8. ~~Cross sections and a surface configuration plate are included in Volume II as 10 and 9 respectively.~~

Surface water monitoring locations are shown on Plate 2.

After the completion of activities at this facility, no structures will remain with the exception of the railroad grade, the tracks, and it's associated drainage structures.

All maps requiring certifications by a registered person have been done so. Included are stamps from experts in related fields such as surveying.

R645-301-331. MINIMIZING IMPACT AND SURFACE
EROSION

Protection measures are described in Appendix F. Revegetation and erosion control are described in Section

R645-301-340 and R645-301-512.240, respectively

**R645-301-332. IMPACTS OF SUBSIDENCE ON RENEWABLE
RESOURCE LANDS**

N/A

**R645-301-333. USING THE BEST TECHNOLOGY
CURRENTLY AVAILABLE TO MINIMIZE
DISTURBANCE AND IMPACT**

See R645-301-310.

**R645-301-333.100. PROTECTION OF THREATENED AND
ENDANGERED SPECIES**

There have been no known threatened or endangered species within the permit area. See R645-301-310.

**R645-301-333.200. SITE-SPECIFIC PROTECTION OF
THREATENED AND ENDANGERED SPECIES**

See R645-301-310.

**R645-301-333.300. PROTECTIVE MEASURES DURING ACTIVE
PHASES OF MINING OPERATIONS**

Appendix F

R645-301-340. RECLAMATION PLAN

The complete reclamation plan is described under R645-301-240.

R645-301-341. REVEGETATION

Revegetation

Revegetation will be accomplished by Andalex or under Andalex's direct supervision and under the recommendations of the regulatory authority. A seed mixture has been developed and can be found in this chapter. This mixture was developed by estimating vegetative types in the sagebrush/grass reference area

established by DOGM and Andalex. Please refer to Appendix I and Plate 1.

R645-301-341.100

SCHEDULE AND TIMETABLE

Schedule of Revegetation

The seeding of native flora (consisting where possible of deer browse species), will commence as soon as is practical following regrading and topsoil replacement. This revegetation will help stabilize the soil and the fill quickly. Revegetation will be accomplished by Andalex or under Andalex's direct supervision and under the recommendations of the regulatory authorities. Revegetation will occur during the first fall planting season following the regrading and topsoil redistribution. Please refer to Revegetation Schedule.

Andalex Resources' Revegetation Schedule

TASK	MONTH:											
	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
Review reveg. plan	XX	X										
Order seed				X								
Regrading				XXXX	XXXX	XXXX						
Spread topsoil							XXX					
Seedbed Prep. ,							XX	X				
Apply fertilizer			XX*					XX				
Seeding								XX	X			
Mulching								XX	X			

Tasks to be done in subsequent years: (years 2, 3, and 5, 9, and 10, following planting, minimum)**

* May need application of N the spring following seeding.

** Productivity will be sampled only during years 9 and 10. Also, the reference area will be sampled during the years 9 and 10.

Andalex Resources' Revegetation Monitoring Schedule

QUALITATIVE OBSERVATIONS:

<u>Reclamation type</u>	<u>YEAR</u>									
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Permanent Reclamation	X	X	X	X	X	X	X	X	X	X
Trial Plantings	X	X	X	X	X	X	X	X	X	X
Test Plots	X	X	X	X	X	X	X	X	X	X
Interim Stabilization	X	X	X	X	X	X	X	X	X	X

QUANTITATIVE OBSERVATIONS:

<u>Parameter</u>	<u>YEAR</u>									
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Cover		X	X		X				X	X
Frequency		X	X		X				X	X
Woody Plant Density		X	X		X				X	X
Transplant Survival	X*	X	X							
Productivity:										
Test plots			X		X				X	X
All Other Revegetation									X	X

* Sampling will take place in the fall of the year.

Soil Testing Plan and Soil Preparation

Where possible the soil will be distributed along the contour. Soil will be redistributed using dump trucks and graders. The thickness of the re-established soil will be consistent with the pre-mining conditions. As this facility was previously impacted by other loading operations, Andalex was unable to gather topsoil on these areas. This will require the use of topsoil substitute material for final reclamation. Andalex has chosen potential topsoil substitute material and is currently in the process of performing the necessary tests and monitoring to demonstrate that it is suitable (page 51). Twenty samples of potential substitute topsoil material have been sent to the Utah State University Soils Lab. There are four test plot locations, A through D (Plate 1), and samples at each location have been taken from 0-6", 6-12", 1-2', 2-3', & 3-4'. Samples will be taken from the new test area west of the railroad tracks at these same depths. All test plots, including the newest plot will be analyzed for: soil color, texture, pH, organic carbon, saturation percentage, alkalinity, electrical conductivity, calcium carbonate percentage, sodium absorption ratio, soluble potassium, magnesium, calcium, sodium, total nitrogen, available phosphorous, available water capacity, and percent rock fragments. The results can be found in Appendix D. Once any of the areas of substitute material have been determined suitable for reclamation, all or part of these areas will be carefully outlined on Plate 1 and the volumes necessary to make up the current topsoil deficit, will be included in the Topsoil Pile Summary. This will require approximately 29,000 additional cubic yards of material.

Prior to final reclamation, samples will be taken of the stored topsoil to determine any deficiencies which would affect the growth of newly revegetated areas. Any deficiencies will be corrected by adding to the soil chemical fertilizers, organic mulch, or any other substances recommended by the regulatory authority. Preparation techniques such as discing will be incorporated.

NOTE: Refer to Appendix S for information about the topsoil mass balance associated with the 2007 Modification Plan. This revised plan demonstrates that there should be sufficient

topsoil stockpiled for final reclamation after construction is completed.

R645-301-341.210. SPECIES AND AMOUNTS PER ACRE OF SEEDS AND/OR SEEDLINGS USED

A reference area has been established by Andalex and DOGM. The sagebrush/grass reference area was used in combination with a vegetation inventory to determine the final seed mixture and amounts of seed to be used for final reclamation.

The following seed mixture, was developed by UDOGM in conjunction with the vegetation inventory.

Wildcat Loadout Final Seed Mixture			
Scientific Name	Common Name	PLS/Ac	Seeds Per/ft ²
<i>Amelanchier utahensis</i>	Utah serviceberry	7.00	4.15
<i>Artemisia tridentata</i>	Big sagebrush	0.06	3.44
<i>Ceratoides lanata</i>	Winterfat	5.00	6.31
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush	0.30	2.75
<i>Purshia tridentata</i>	Bitterbrush	12.00	4.13
<i>Archillea millefolium</i>	Yarrow	0.05	3.18
<i>Hedysatum boreale</i>	Northern sweetvetch	8.00	6.17
<i>Linum lewisii</i>	Lewis flax	1.00	6.38
<i>Penstemon palmeri</i>	Palmer penstemon	0.50	7.00
<i>Viguiera multiflora</i>	Showy goldeneye	0.20	4.84
<i>Bouteloua gracilis</i>	Blue grama	0.60	9.79
<i>Elymus spicatus</i>	Bluebunch wheatgrass	2.50	8.03
<i>Elymus trachycaulus</i>	Slender wheatgrass	2.50	9.18
<i>Hilaria jamesii</i>	Galleta	2.50	9.13
<i>Stipa comata</i>	Needle-and-thread grass	3.00	7.92
<i>Stipa hymenoides</i>	Indian ricegrass	2.00	8.63
TOTALS		47.21	101.06

Wildcat Loadout Interim Seed Mixture			
Scientific Name	Common Name	PLS/Ac	Seeds Per/ft ²
<i>Archillea millefolium</i>	Yarrow	0.30	19.08
<i>Elymus lanceolatus</i>	Thickspike Wheatgrass	8.00	28.28
<i>Elymus smithii</i>	Western Wheatgrass	9.00	26.03
<i>Elymus stachycaulus</i>	Slender Wheatgrass	8.00	29.38
TOTALS		26.30	102.78

R645-301-341.220.

METHODS USED IN PLANTING AND SEEDING

All reclaimed areas will be stabilized by gouging prior to reseeding. The gouging will be done with a backhoe or trackhoe, and will consist of gouges at least 18" deep by 14" - 36" wide, spaced approximately 6' - 10' apart. The gouging precludes the use of a drill-seeder; therefore, all areas will then be hydroseeded and hydromulched.

R645-301-341.230.

MULCHING TECHNIQUES

Vegetative cover will be promptly re-established following cessation of mining activities to stabilize erosion. Re-seeding will occur during the first normal period for favorable growth following regrading. Mulch will be applied to all reseeded areas. Areas which are hydromulched will be done so using an organic type mulch at the rate of one ton per acre. Where hydroseeding and hydromulching occur, a tackifier will be added to both the seed and the mulch.

Mulch will be used wherever seeds are planted. These areas are shown on Plate 9 and constitute 60.94 acres.

R645-301-341.240.

IRRIGATION AND PEST CONTROL MEASURES

Management Practices, e.g., Irrigation, Pest, and Disease Control

No mechanical irrigation will be used because of the lack of water in the area. Vegetative growth will be subject to normal rainfall and winter snowfall. Vegetation will be protected from both wildlife and livestock by drift-fences until the reclaimed areas have been adequately re-established. Upon approval, the fences will be removed. Fences are already standing surrounding the permit area. Pesticides and herbicides will be issued as necessary. Should any persistent pesticides be needed, the Division's approval will be obtained prior to their use.

To date, Andalex has had no use for poisons for rodent control or any other persistent pesticide.

Also see R645-301-240

**R645-301-341.250. METHODS USED TO DETERMINE
 REVEGETATION SUCCESS**

Revegetation will be closely monitored. Areas which fail to support sufficient growth to stabilize conditions will be tested and reseeded until a proper cover is established. Physical examinations will be conducted to note any species which are not thriving or regenerating. If this occurs, species will be substituted at the recommendation of the regulatory authority. Any other species will be added at the time of reclamation upon recommendation of the regulatory authority. All reclaimed areas will be monitored and maintained by the constant observation of Andalex until the surety release is granted. This will include slope staking on any sloped areas.

Revegetation monitoring parameters to be measured are growth rate, plant density and percent cover. We would expect to monitor or supervise monitoring at least monthly during the first two growing seasons. From experience with interim revegetation at the minesite, we have learned that two growing seasons are needed to establish any success. After this we would know whether reclamation was progressing successfully.

Andalex is committed to quantitative sampling of reclamation cover, frequency and woody plant density during years 2, 3, 5, 9, and 10. Productivity will be sampled only during years 9 and 10. The reference area will be sampled during years 9 and 10.

**R645-301-341.300. STUDIES AND TESTING TO DEMONSTRATE
 FEASIBILITY OF REVEGETATION PLAN**

See R645-301-240.

R645-301-342. FISH AND WILDLIFE

See R645-301-310.

R645-301-342.100.

ENHANCEMENT MEASURES

Appendix F. Andalex will endeavor to use the best technology current available to enhance wildlife habitat during the reclamation phase of its operation. This will include, but not be limited to water sources (if available), thermal cover, escapeways, hiding and loafing places, and travelways. ANDALEX will consult with the Division of Wildlife Resources, at the time of final reclamation, to determine exactly what reclamation designs, planting arrangements, and artificial structures would best enhance a wildlife habitat.

R645-301-342.200.

PLANT SPECIES SELECTION

See R645-301-310.

R645-301-342.210.

NUTRITIONAL VALUE

Appendix E

R645-301-342.220.

COVER AND PROTECTION

Appendix F

R645-301-342.230.

**ABILITY TO SUPPORT AND ENHANCE
HABITAT**

Appendix F

R645-301-342.300.

CROPLAND

N/A

R645-301-342.400.

**RESIDENTIAL, PUBLIC SERVICE OR
INDUSTRIAL LAND USE**

N/A - The post mining land use does not include residential, public service or industrial use.

R645-301-350.

PERFORMANCE STANDARDS

R645-301-351.

GENERAL REQUIREMENTS

All loadout and reclamation operations will be carried out according to plans provided under R645-301-330 through R645-301-340.

R645-301-352.

CONTEMPORANEOUS RECLAMATION

Contemporaneous revegetation at the Wildcat Loadout will occur on topsoil piles and sediment pond embankments. The vast majority of the site will remain disturbed to facilitate the operation, until final reclamation.

R645-301-353.

REVEGETATION: GENERAL REQUIREMENTS

R645-301-353.100.

VEGETATIVE COVER

The vegetative cover will be as stated in the following categories.

R645-301-353.110.

DIVERSITY, EFFECTIVENESS AND PERMANENCE (Also R645-301-356 and 357)

The vegetative cover will be diverse, effective and permanent. Standards for reclamation success will be evaluated accordance with DOGM's "Vegetation Information and Monitoring Guidelines", Appendix A. The success of final reclamation will be judged on the effectiveness of the vegetation for the postmining land use and the extent of cover compared to the extent of cover for the reference area. Ground cover, production or stocking will be considered equal to the approved success standard when it reaches 90% of the success standard. Statistical adequacy of all statistical sampling will be determined using the following formula:

$$N_{mm} = \frac{t^2 S^2}{(dx)^2}$$

where: t = the value from appropriate t-table*, (2-tail test for pre-mine studies, 1-tail test for success studies)
s = the sample standard deviation,
d = the desired change in the mean,
x = the sample mean of the parameter in question
* = All parameters are to be tested at the 90% confidence level with a 10% change in the mean (d = .1).

Ground cover will be estimated by using one of the methods listed in "Vegetation Information Guidelines" Appendix A.

Andalex does not propose to stock shrubs or trees during interim or final revegetation.

Production measurements will be made in accordance with DOGM's "Vegetation Information Guidelines" Appendix A. Estimates may be made by the methodology which the vegetation consultant feels is the most suitable method to used for the work being performed.

An evaluation of species composition will be made, including species present, form and diversity.

For a postmining land use of grazing and wildlife habitat, the ground cover and production will be equal to or greater than a reference area. The Division's "Vegetation Information Guidelines", Appendix A will be utilized for the evaluation of the success of revegetation. Appendix B will be references for calculating diversity.

Siltation structures will be maintained until the disturbed area is revegetated and stabilized. They will remain in place at least two years after the last augmented seeding. Siltation structures may include straw bales, silt fences or filter baskets. Removal will be contingent upon revegetation and stabilization of the area as well as DOGM concurrence. Following removal, the area will be revegetated in accordance with the reclamation plan.

R645-301-353.120. NATIVE OR DESIRABLE INTRODUCED SPECIES

The vegetative cover will be comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division. (See R645-301-240)

R645-301-353.130. EXTENT OF COVER

The vegetative cover will be at least equal in extent of cover to the reference area.

**R645-301-353.140. STABILIZING SOIL FROM SURFACE
EROSION**

The vegetative cover will be capable of stabilizing the soil surface from erosion. (See R645-301-240)

R645-301-353.200. REESTABLISHED PLANT SPECIES

The reestablished plant species will:

**R645-301-353.210. COMPATIBILITY WITH APPROVED POST-
MINING LAND USE**

The reestablished plant species will be compatible with the approved postmining land use.
(See R645-301-240)

R645-301-353.220. SEASONAL CHARACTERISTICS OF GROWTH

The reestablished plant species will have the same seasonal characteristics of growth as the original vegetation.
(See R645-301-240)

**R645-301-353.230. SELF-REGENERATION AND PLANT
SUCCESSION**

The reestablished plant species will be capable of self-regeneration and plant succession.
(See R645-301-240)

**R645-301-353.240. COMPATIBILITY WITH AREA PLANT AND
ANIMAL SPECIES**

The reestablished plant species will be compatible with the plant and animal species of the area.
(See R645-301-240)

**R645-301-353.250. COMPLIANCE WITH OTHER APPLICABLE
LAWS OR REGULATIONS**

The reestablished plant species will meet the requirements of applicable Utah and federal seed, poisonous and noxious plant; and introduced species laws or regulations. The seed tag will be provided to the Division, as requested.

R645-301-353.300. EXCEPTION TO REQUIEMENTS

N/A - No request for exception.

R645-301-353.400. CROPLAND

N/A - Crop land is not a post mining land use.

R645-301-354. REVEGETATION: TIMING

Disturbed areas will be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting in this area is in the fall.

**R645-301-355. REVEGETATION MULCHING AND OTHER
SOIL STABILIZING PRACTICES**

See R645-301-341.230.

**R645-301-356 REVEGETATION: STANDARDS FOR
SUCCESS**

**R645-301-356.100. EFFECTIVENESS OF VEGETATION FOR
POST-MINING LAND USE**

See R645-301-353.110

R645-301-356.110. STANDARDS FOR SUCCESS: GUIDELINES

See R645-301-240 and R645-301-353.110

R645-301-356.120. SAMPLING TECHNIQUES

See R645-301-353.110.

R645-301-356.200. CONDITIONS FOR SUCCESS

See R645-301-353.110.

R645-301-356.210. GRAZING OR PASTURE LAND

See R645-301-331 and R645-301-353.110.

R645-301-356.220. CROPLAND

N/A

R645-301-356.230. FISH AND WILDLIFE

See R645-301-353.110 and R645-301-331.

R645-301-356.231. STOCKING AND PLANTING

See R645-301-331

R645-301-356.232. TREES AND SHRUBS

See R645-301-331

**R645-301-356.240. INDUSTRIAL, COMMERCIAL OR
RESIDENTIAL**

N/A

R645-301-356.250. PREVIOUSLY DISTURBED AREAS

See R645-301-240 and R645-301-331

R645-301-356.300. SILTATION STRUCTURES

See R645-301-240 and R645-301-310.

R645-301-356.400. REMOVAL OF SILTATION STRUCTURES

See R645-301-240 and R645-301-310.

**R645-301-357. REVEGETATION: EXTENDED
RESPONSIBILITY PERIOD**

**R645-301-357.100. BEGINNING OF EXTENDED
RESPONSIBILITY PERIOD**

See R645-301-240

R645-301-357.200. VEGETATION PARAMETERS FOR SUCCESS

See R645-301-240 and R645-301-341.250

**R645-301-357.210. GREATER THAN 26.0 INCHES ANNUAL
PRECIPITATION**

N/A

**R645-301-357.220. LESS THAN 26.0 INCHES ANNUAL
PRECIPITATION**

See R645-301-240 and R645-301-341.250.

**R645-301-357.300. HUSBANDRY PRACTICES - GENERAL
INFORMATION**

R645-301-357.301. SELECTIVE HUSBANDRY PRACTICES

N/A - There are no selective husbandry practices requested at this time. Such selective practices cannot be determined until the property is reclaimed and reclamation success is evaluated.

R645-301-357.302. DEMONSTRATION OF PRACTICES

N/A

R645-301-357.303. BONDED AREA

N/A

**R645-301-357.304. EXTENDED RESPONSIBILITY FOR
RESEEDED AREAS**

Per Division

R645-301-357.310. REESTABLISHING TREES AND SHRUBS

See R645-301-240.

R645-301-357.311. RATE OF REPLANTING

See R645-301-241.210.

R645-301-357.312. ESTABLISHMENT BY SEED

See R645-301-341.210.

R645-301-357.320. WEED CONTROL AND ASSOCIATED REVEGETATION

Management Practices, e.g., Irrigation, Pest, and Disease Control

No mechanical irrigation will be used because of the lack of water in the area. Vegetative growth will be subject to normal rainfall and winter snowfall. Vegetation will be protected from both wildlife and livestock by drift-fences until the reclaimed areas have been adequately re-established. Upon approval, the fences will be removed. Fences are already standing surrounding the permit area. Pesticides and herbicides will be issued as necessary. Should any persistent pesticides be needed, the Division's approval will be obtained prior to their use.

To date, Andalex has had no use for poisons for rodent control or any other persistent pesticide.

Also see R645-301-240

R645-301-357.321. CHEMICAL WEED CONTROL

See R645-301-240 and R645-301-357.320.

R645-301-357.322. MECHANICAL WEED CONTROL

See R645-301-240

R645-301-357.323. BIOLOGICAL WEED CONTROL

See R645-301-240

R645-301-357.324. RESEEDING DAMAGED AREAS

See R645-301-240

R645-301-357.330. CONTROL OF OTHER PESTS

See R645-301-357.320

R645-301-357.331. CONTROL OF BIG GAME

See R645-301-240

R645-301-357.332. CONTROL OF SMALL MAMMALS AND INSECTS

See R645-301-240

R645-301-357.341. AREA OF RESEEDING: NATURAL DISASTERS

See R645-301-240

R645-301-357.342. SUCCESS STANDARDS FOLLOWING A DISASTER

See R645-301-331

R645-301-357.343. TIMING OF RESEEDING FOLLOWING A DISASTER

See R645-301-240

R645-301-357.350. IRRIGATION

N/A - Not Planned

R645-301-357.360. RILL AND GULLEY REPAIR

See R645-301-212

R645-301-357.361. GREATER THAN 3% OF AREA

See R645-301-240

R645-301-357.362. EXTENT OF AFFECTED AREA

See R645-301-240

R645-301-357.363. AREA DEFINED BY RESEEDING

See R645-301-240

R645-301-357.364. RESULT OF DEFICIENT PLANS

See R645-301-240

R645-301-357.365. DEMONSTRATION OF METHOD

See R645-301-240

**R645-301-358. PROTECTION OF FISH, WILDLIFE AND
RELATED ENVIRONMENTAL VALUES**

See R645-301-310

R645-301-358.100. ENDANGERED OR THREATENED SPECIES

See R645-301-310

R645-301-358.200. BALD OR GOLDEN EAGLES

See R645-301-310

R645-301-358.300. ENDANGERED SPECIES ACT

See R645-301-310

R645-301-358.400. WETLANDS/RIPARIAN VEGETATION

See R645-301-310

**R645-301-358.500. BEST TECHNOLOGY CURRENTLY
AVAILABLE**

See R645-301-310

R645-301-358.510. MINIMIZE ELECTRICAL HAZARDS

See R645-301-310

R645-301-358.520. PASSAGE FOR LARGE MAMMALS

See R645-301-310

**R645-301-358.530. PONDS CONTAINING HAZARDOUS OR
TOXIC MATERIALS**

See R645-301-310

CHAPTER 4

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CHAPTER 4, LAND USE & AIR QUALITY

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R645-301-400. LAND USE AND AIR QUALITY

R645-301-410. LAND USE

R645-301-411. ENVIRONMENTAL DESCRIPTION

Because of the vegetation and poor rainfall, the land is presently used only for grazing, wildlife habitat, and limited outdoor recreation. Historically, the land has also been used for coal loading.

R645-301-411.100. PREMINING LAND USE INFORMATION

Past mining in the vicinity of Wildcat includes ARCO'S Beaver Creek Mines (ten miles to the west). The Swisher Coal Company previously used the Wildcat Siding.

R645-301-411.110.

**USES OF THE LAND AT THE TIME OF
FILING APPLICATION**

The wildcat Loadout area would fall into two land use categories: 1) Fish and Wildlife habitat and recreation lands, and 2) Range Lands. County zoning regulations (1974) indicate all lands involved in the lease application area are within Zone M and G1 which is for mining and grazing. Current land use consists of grazing, wildlife habitat, and deer hunting. No other game species are found in the area. For recreational purposes, the land is suitable for deer hunting as well as ATV riding and occasionally snowmobiling. There are no oil and gas wells or water wells.

The area is ten miles from Price, but the unavailability of water precludes any development for residential or summer homes.

R645-301-411.120.

**LAND USE DESCRIPTION IN
CONJUNCTION WITH OTHER
ENVIRONMENTAL RESOURCES
INFORMATION**

Livestock grazing has been the most intense use of the permit area.

Mule deer are found within the lease area as well as the usual small mammals, predators, and passerine and raptorial birds.

Outdoor recreation in the lease area is limited and usually related to enjoyment of the open space and associated scenic facilities and hunting for wild animals.

R645-301-411.130.

**EXISTING LAND USES AND LAND USE
CLASSIFICATION**

See R645-301-411.110

R645-301-411.140.

**CULTURAL AND HISTORIC RESOURCES
INFORMATION**

To assure that no archaeological or historical sites existed in the proposed permit area. A reconnaissance survey has been conducted.

This survey was conducted based on requirements of the Bureau of Land Management prior to the issuance of the right-of-way. All of the surface within this permit area is under the jurisdiction of the Bureau of Land Management.

Prior to this investigation, no recorded archaeological studies of any kind had ever been one in the survey area. Please see Appendix A.

Archaeological clearance was granted based on this survey.

NOTE: Refer to Appendix S for information about the cultural and historic resource surveys associated with the 2007 Modification Plan. Archeological clearance reports for the coal pad extension area and the material storage areas can be found in Appendix A Supplement.

**R645-301-411.141. CULTURAL AND HISTORIC RESOURCES
MAPS**

See Appendix A

**R645-301-411.141.1 PUBLIC PARKS AND LOCATIONS OF ANY
CULTURAL OR HISTORICAL RESOURCES**

N/A - There are no public parks in the proposed permit area or nearby vicinity. No other cultural or historical resources are known to exist in the area.

R645-301-411.141.2 CEMETERIES

N/A - There are no cemeteries or burial grounds in or within 100 feet of the permit area.

**R645-301-411.141.3 NATIONAL SYSTEM OF TRAILS OR THE
WILD AND SCENIC RIVERS SYSTEM**

N/A

**R645-301-411.142 COORDINATION WITH THE STATE
HISTORIC PRESERVATION OFFICER
(SHPO)**

See Appendix A

R645-301-411.142.1 PREVENTION OF ADVERSE IMPACTS

See Appendix A

**R645-301-411.142.2 VALID EXISTING RIGHTS OR JOINT
AGENCY APPROVAL**

R645-301-411.143

IMPORTANT HISTORIC AND
ARCHAEOLOGICAL RESOURCES THAT MAY
BE ELIGIBLE FOR LISTING ON THE
NATIONAL REGISTER OF HISTORIC
PLACES

N/A - See Appendix A

R645-301-411.143.1

COLLECTION OF ADDITIONAL
INFORMATION

See Appendix A

R645-301-411.143.2

CONDUCTING FIELD INVESTIGATIONS

See Appendix A.

R645-301-411.143.3

OTHER APPROPRIATE ANALYSES

See Appendix A.

R645-301-411.144.

APPROPRIATE MITIGATION AND
TREATMENT MEASURES

See Appendix A.

R645-301-411.200.

PREVIOUS MINING ACTIVITY

No mining ever occurred at this site. The area was used as a coal processing and loadout facility.

R645-301-411.210.

TYPE OF MINING METHOD USED

Area was used as a processing/loadout facility.

R645-301-411.220.

COAL SEAMS OR OTHER MINERAL STRATA
MINED

N/A

R645-301-411.230.

EXTENT OF COAL OR OTHER MINERALS
REMOVED

N/A

R645-301-411.240. APPROXIMATE DATES OF PAST MINING

The loadout area was used from approximately 1960 to present under various operators.

R645-301-411.250. USES OF LAND PRECEDING MINING

See R645-301-411.140.

R645-301-412. RECLAMATION PLAN

See R645-301-240.

R645-301-412.100. POSTMINING LAND USE PLAN

The post-mining land use will consist of livestock grazing with wildlife habitat and some recreation.

**R645-301-412.110. ACHIEVEMENT OF PROPOSED POSTMINING
LAND USE**

See R645-301-412.100.

R645-301-412.120. RANGE OR GRAZING LAND USE

See R645-301-412.100.

R645-301-412.130. ALTERNATE POSTMINING LAND USE

N/A

**R645-301-412.140. CONSISTENCY WITH SURFACE OWNER
PLANS AND APPLICABLE UTAH AND
LOCAL LAND USE PLANS**

Socioeconomic Impacts

The proposed project is located in an area where coal mining is the major industry, therefore, the community is geared for coal operations. The labor supply is excellent, well-trained, and available. Most people in this area have a very favorable attitude towards the increased coal activity. They look forward to growth in the area which will increase population, home construction, and provide other facilities for community use.

The need for development of additional housing, school space, and changes in present community services would be among the greatest

impacts, due to the increase in population. Positive effects of the project will be to increase the number of jobs, payroll, and taxes thus helping to build the community.

Land Use Changes

The limited resources, both physical and scenic, will dictate no future change in land status. Considering the extent and nature of similar lands in this area, no uses other than those previously discussed can be forecast.

Wildcat has been unsightly since coal loading activities began with the Swisher Coal Company. The new loadout is in the same area as the old tipples and waste dumps. These waste dumps are numerous and located throughout the permit area and consist of coal fines which were unmarketable during the earlier mining history. This new operation will actually be a significant reclamation phase to the permit area.

After completion of loading operations, the land will continue to be used for grazing and hunting. Although hunting may occur within the permit area during operations, grazing will not. No future change is dictated in the land status. All disturbed land will be restored in a timely manner, according to the Reclamation Plan outlined in Chapter 5, to conditions that are capable of supporting the uses they were capable of supporting before mining.

R645-301-412.200. LAND OWNER OR SURFACE MANAGER COMMENTS

As there are no proposed land use changes, there have been no negative comments from legal or equitable owners of record of surface areas to be affected or from any state or local agencies.

R645-301-412.300. SUITABILITY AND COMPATIBILITY

See R645-301-412.200.

R645-301-413. PERFORMANCE STANDARDS

R645-301-413.100. POSTMINING LAND USE

See R645-301-412.100.

R645-301-413.110. CAPABILITY OF SUPPORTING POSTMINING LAND USE

See R645-301-412.100.

R645-301-413.120. HIGHER OR BETTER USES

See R645-301-412.100.

R645-301-413.200. DETERMINING PREMINING USES OF LAND

See R645-301-412.100.

**R645-301-413.210. PREMINING USES OF LAND NOT
PREVIOUSLY MINED**

See R645-301-412.100.

**R645-301-413.220. POSTMINING LAND USE FOR LAND THAT
HAS BEEN PREVIOUSLY MINED AND NOT
RECLAIMED**

See R645-301-412.100.

**R645-301-413.300. CRITERIA FOR ALTERNATIVE
POSTMINING LAND USES**

N/A

**R645-301-413.310. LIKELIHOOD FOR ACHIEVEMENT LAND
USE**

Post-mining land use as proposed shall be achieved.

**R645-301-413.320. HAZARDS TO PUBLIC HEALTH OR
SAFETY, OR THREAT OF WATER
DIMINUTION OR POLLUTION**

N/A

R645-301-413.330. PROHIBITED LAND USES

N/A

R645-301-413.331. IMPRACTICAL OR UNREASONABLE

N/A

R645-301-413.332.

INCONSISTENT WITH APPLICABLE LAND
USE POLICIES

N/A

R645-301-413.333.

UNREASONABLE DELAY IN
IMPLEMENTATION

N/A

R645-301-413.334.

VIOLATION OF FEDERAL, UTAH OR
LOCAL LAW

N/A

R645-301-414.

PERMIT REVISIONS REQUESTING
APPROVAL OF ALTERNATE POSTMINING
LAND USE

N/A

R645-301-414.100.

FILING DEADLINES

N/A

R645-301-414.200.

SIGNIFICANT ALTERATION FROM MINING
OPERATIONS IN THE ORIGINAL PERMIT

N/A

R645-301-414.300.

OTHER REQUIREMENTS

N/A

R645-301-420.

AIR QUALITY

(Also R645-301-421, 422 and 423)

Existing Environment

The permit area is located in a Class II air quality area.

Air Quality Impact Analysis

Air quality information has been submitted and approved by the State Bureau of Air Quality. See Appendix B.

The existing Air Quality Approval Order (DAQE-005-00) provides for a maximum coal stockpile area of 20 acres. ~~Although the present stockpile area is well below this figure, there is a potential for the required stockpiles to increase up to, and even beyond, the present approved area; therefore,~~ Andalex Resources, Inc. has submitted a request for modification of its Approval Order to provide for additional stockpile area, as well as increased tonnage and diesel usage. The length of the haul road has not been changed at this time, since no changes in haul roads have taken place since the approval. Haul road lengths will change with the future expansion plans, and will be addressed with a revised Air Quality Plan at that time.

Emission Estimates

Andalex's inventory has been reviewed and approved by the Utah Bureau of Air Quality and the E.P.A.

PSD Permit and Compliance with Air Quality Laws

The Environmental Protection Agency has determined that this project does not require a PSD Air Quality Permit. The loadout is not subject to the PSD regulations because of the new definition of a major source.

R645-301-421. CLEAN AIR ACT AND OTHER APPLICABLE LAWS

See R645-301-420.

R645-301-422. UTAH BUREAU OF AIR QUALITY

See R645-301-420.

R645-301-423. SURFACE COAL MINING AND RECLAMATION ACTIVITIES EXCEEDING 1,000,000 TONS PER YEAR

See R645-301-420.

R645-301-423.100. COMPLIANCE WITH FEDERAL AND UTAH AIR QUALITY STANDARDS

See R645-301-420.

The Wildcat Loadout and surrounding area were impacted by a previous pre-law operator. This operation left a fair amount of the existing permit area, as well as an unknown amount of the adjacent, undisturbed area, impacted by accumulations of coal fines. After Andalex Resources, Inc. took over the site, the operation was permitted under SMCRA and obtained an Air Quality Approval Order. The problem of coal fine accumulation on, and around, this area has been addressed by Andalex since the beginning of the Wildcat Loadout operation, and has included remedial measures such as scraping coal off previously impacted areas to salvage topsoil, and vacuuming coal fines from undisturbed, impacted areas to protect soils and vegetation. In addition, Andalex Resources, Inc. has implemented a considerable number of dust control measures at the Wildcat Loadout to reduce fugitive dust and wind-blown coal fines. The following are some of the measures incorporated into the design and operation of the facility to reduce dust emissions:

- (1) All roads are paved or gravel surfaced;
- (2) Road speed limits are posted at 5 mph;
- (3) Roads are chemically treated and watered on a regular basis;
- (4) Truck dump hoppers are located below ground and equipped with sprays;
- (5) Coal is recovered from stockpiles via underpile reclaim systems;
- (6) All surface conveyors are covered;
- (7) Conveyor transfer points are enclosed;
- (8) Radial stackers load at the highest point of the pile to minimize drop distances;
- (9) Railcars are loaded from an enclosed bin and extendable chute;
- (10) Refuse pile is regularly compacted and watered as needed;
- (11) Coal moisture is maintained at a minimum of 6% overall;
- (12) Moisture content of minus 40 mesh coal is at least 4.0% by weight;
- (13) All disturbed areas are drained to sedimentation ponds;
- (14) Runoff from ASCA areas is controlled by containment, vegetation, silt fences and/or straw bales;
- (15) Wind fences are employed along the eastern edge of the largest stockpile, near Pond B;
- (16) The location of stockpiles (more to the west) helps confine the wind-blown coal fines within the permit area.

The designs of the various controls listed above have been provided in the following sections of this permit:

- (1) Impoundments/Hydrology - R645-301-512.240
- (2) Roads - R645-301-512.250
- (3) Operations - R645-301-520
- (4) Coal Handling - R645-301-521.

~~While the above controls and practices are designed to minimize fugitive dust and wind-blown coal fines, it is impossible to completely eliminate them. As a result, some soils and vegetation will be impacted by dust accumulations in the future. To minimize these impacts, Andalex Resources, Inc. proposes vacuuming of coal fine accumulations on undisturbed areas within the permit area either prior to salvage of the topsoil or prior to reclamation/reseeding. Vacuuming is considered by Andalex as the best and least destructive option for removal of coal fine accumulations.~~

~~There is also some potential for coal dust to be blown beyond the permit boundary under extreme wind conditions. There is evidence of coal dust outside the permit area, but the time and source of these accumulations are unknown. Andalex Resources, Inc. is therefore proposing to conduct a program to monitor coal fine deposition outside the permit area, specifically east of the permit boundary. The proposed monitoring is described in Appendix P, Response to Division Order DO-04, by Patrick D. Collins, Ph.D.~~

NOTE: Refer to Appendix S for information about fugitive dust control associated with the 2007 Modification Plan

R645-301-424. FUGITIVE DUST CONTROL - SURFACE COAL MINING AND RECLAMATION OPERATIONS LESS THAN 1,000,000 TONS PER YEAR

N/A - Greater than 1,000,000 ton/yr.

R645-301-425. AIR QUALITY MONITORING - SURFACE COAL MINING AND RECLAMATION OPERATIONS LESS THAN 1,000,000 TONS PER YEAR

N/A

CHAPTER 5

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CHAPTER 5, ENGINEERING

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R645-301-500. ENGINEERING

R645-301-510. INTRODUCTION

Volume II of this PAP contains plates which support the narrative of Volume I. These maps include, but are not limited to, contiguous surface and subsurface owners, the permit boundary including the area to be affected over the life of the project, a plate depicting all buildings and structures within 1,000 feet of the permit area and any surface or subsurface man-made features (powerline). Much of this information is combined on individual maps, e.g., the man-made features are on Plate 1 which also depicts buildings within 1,000 feet.

The location and boundaries of the revegetation reference area are shown on Plate 1.

Figure VII-2 depicts surface waters and receiving waters in the vicinity of the permit area. The Gordon Creek Road (County Road 139) is also depicted as it relates to the permit area on the surface facilities map.

Cross Sections, Maps, and Plans

(Also R645-301-511, 521.140, 521.150, 521.160, 521.170, 521.180 and R645-301-722)

Many of the plans of this section are not applicable to the Wildcat Loadout Facility as it is strictly a surface facility and plans showing core samples, nature of coal seams, outcrops, active underground and abandoned workings or any others pertaining to mining (surface or underground) are not included.

Surface water monitoring stations are included on Plate 2.

Subsurface water has not been encountered within the permit area and the only surface water would consist of sediment ponds and diversion ditches which become surface waters only in direct response to a precipitation event. These, along with the one spring located southwest of the permit area, are shown on Plate 2 and Figure VII-2 respectively.

~~There are no oil or gas wells in or adjacent to this permit area.~~ *There is a gas well drill site located near the southeast part of the facility, adjacent to the public road. The drillhole has been capped and the site has been reclaimed. This work was done by Conoco-Phillips.*

Slopes are represented by topographic maps (Plate 1) and final reclamation contours (Plate 9). ~~The cross sections, through these two topographic maps, are shown on Plate 10. From this, a mass balance was developed.~~

Operation Plan: Maps and Plans

The lands affected by this operation (surface only) are clearly shown on Plate 1. Plate 1 depicts all buildings, utilities, and facilities. ~~All of the land within this permit area which is to be affected already has been.~~ This is a surface facility only and involves no underground workings. The bond required by the Division is for the entire affected area including all the surface facilities.

The permit area shown on Plates 1, 1A and 16 contains 270 acres, *and coincides with the BLM right-of-way (U-48027) boundary. It is important to note that this is a non-*

exclusive areal right-of-way, and that there are numerous other equally valid rights-of-way which occupy much of this same area. For example, overlapping rights-of-ways exist for the Utah Railway tracks, the State Highway 139, the Carbon County Consumers Road, the by-pass road, the Trestle public road, Rocky Mountain Power 46 KV powerline, Phillip Petroleum's gas well and pipeline corridor, and Hidden Splendor shop facility. BLM determined the final 270 acre configuration in part to "square up" the boundary for administrative purposes. Being a non-exclusive right-of-way means there is no conflict among grantees, and no inherent liability from one grantee to the next, as long as each grantee's activities are within the terms of their respective right-of-way.) The bonded area shown on Plates 1 and 1A is 81.79 acres. This represents the actual (and proposed) disturbed area consisting of 75.33 acres of operational areas which will eventually be re-topsoiled and 6.46 acres which are occupied by topsoil storage piles during the interim. ~~including 17.51 acres of ASCA's and excluding 2.78 acres of Utah Railway track. The disturbed area shown on those maps is 60.94 acres. This acreage represents all actual disturbed areas within the site, and does not include the ASCA's or the Utah Railway track. The 60.94 acres of disturbed area also represents the area where topsoil (or substitute topsoil) will be placed upon final reclamation. ASCA's are excluded from this figure since topsoil has not been removed from those areas. The track is excluded since it will remain after reclamation~~

Coal storage, topsoil storage, loading areas, coal preparation waste areas are all depicted on the surface facilities map. Additional detail on topsoil, diversions, and ponds can be found in Volume II on Plates 2, 13A, 13B, 13C, 2, and 3A through H, and in Appendix S.

There is no storage of explosives at the Wildcat Loadout.

The final surface configurations will be similar to the surface prior to Andalex's involvement at Wildcat, *as shown on Plate 9.* ~~Cross sections and a surface configuration plate are included in Volume II as 10 and 9 respectively.~~

Surface water monitoring locations are shown on Plate 2.

After the completion of activities at this facility, no structures will remain with the exception of the railroad grade, the tracks, and it's associated drainage structures.

All maps requiring certifications by a registered person have been done so. Included are stamps from experts in

related fields such as surveying.

Maps and Plans

The following is a list of maps and plans included with this application as Volume II. Those maps which require certification by a registered professional engineer bear that mark. These maps and plans, when used in conjunction with Volume I (the text), will constitute a complete plan for the Wildcat Loadout Facility. ~~As this facility has already been completely constructed, the maps do not include any "as proposed" facilities, only existing ones.~~ *Refer to Appendix S for information regarding proposed construction associated with the 2007 Modification Plan.* Along with the facilities, plates are included, environmental resource maps, and reclamation plans. It should be noted that a wildlife distribution map is not included based on the State Division of Wildlife Resources' comments (please see Appendix F).

PLATES

PLATE #	PLATE TITLE
Plate 1	Existing Surface Facility Map
Plate 1A	Proposed Surface Facility Map
Plate 2	Drainage Map
Plate 3A	Sediment Pond C
Plate 3B	Sediment Pond E
Plate 3C	Sediment Pond F
Plate 3D	Sediment Pond G
Plate 3E	Sediment Pond H
Plate 3F	Sediment Pond I
Plate 3G	Permanent Impoundment
Plate 3H	Depression Area
Plate 4	Deleted
Plate 5	Deleted
Plate 6	Deleted
Plate 7	Deleted
Plate 8	Reclamation Hydrology
Plate 9	Final Reclamation
Plate 10	Deleted
Plate 11	Soils Map
Plate 12	Geology Map
Plate 13A	Topsoil Piles
Plate 13B	Topsoil Piles
Plate 14	Deleted
Plate 15	Watershed Map
Plate 16	Surface and Subsurface Ownership Map
Plate 17	Typical Road Cross-sections
Plate 18	Deleted
Plate 19	Deleted
Plate 20	Deleted

R645-301-511.

GENERAL REQUIREMENTS

See R645-301-510.

R645-301-511.100.

**PROPOSED COAL MINING AND
RECLAMATION OPERATIONS**

See R645-301-510.

R645-301-511.200.

**POTENTIAL IMPACTS TO THE
ENVIRONMENT**

See R645-301-510.

R645-301-511.300.

RECLAMATION

See R645-301-240.

R645-301-512.

CERTIFICATION

See Volume II and R645-301-510.

R645-301-512.100.

CROSS SECTIONS AND MAPS

See R645-301-510.

R645-301-512.110.

MINE WORKINGS TO THE EXTENT KNOWN

N/A - There are no mine workings associated with this project.

R645-301-512.120.

SURFACE FACILITIES AND OPERATIONS

See Volume II, Plates 1 and 2. All applicable maps are certified.

R645-301-512.130.

SURFACE CONFIGURATIONS

See Volume II, Plates 1 and 2. All applicable maps are certified.

R645-301-512.140.

HYDROLOGY

(Also R645-301-722)

Refer to Appendix R

R645-301-512.150. GEOLOGIC CROSS SECTIONS AND MAPS

See Volume II, Plate 12. All applicable maps are certified.

R645-301-512.200. PLANS AND ENGINEERING DESIGNS

Applicable plans, such as for impoundments and primary roads have been certified by a qualified, registered professional engineer and are included in the following sections.

R645-301-512.210. EXCESS SPOIL

N/A - There are no plans for excess spoil at this facility.

R645-301-512.220. DURABLE ROCK FILLS

N/A - There are no plans for durable rock fills at this facility.

R645-301-512.230. COAL MINE WASTE

This is strictly a surface facility, there will be no underground development wastes.

Coal Processing Waste (Also R645-301-513.800, 536, and relevant portions of Sections R645-301-735, 736, 737, 745, 746, 747, and 754)

During processing, a small amount of boney material and rock is removed from the lump coal product. It is currently proposed to dispose of this material on the west side of Wildcat in a previously disturbed area which reports to the sedimentation ponds.

In accordance with requirements of 30 CFR 77.215-2, a refuse disposal plan has been filed with MSHA. An MSHA I.D. number has been issued for this pile - 1211-UT-09-01864-01. The required disposal plan and maps are included as Appendix O of this M.R.P.

If it is determined through testing that this material is acid- or toxic-forming, then the disposal will consist of burial on the west side of Wildcat (Plate 1) or haulage to another approved coal processing waste disposal area. The Division will be notified if the coal processing waste is to be moved off-site to another approved disposal area. All coal processing waste piles shall be inspected at least quarterly, by a qualified registered engineer. This person

will be responsible for inspecting visual factors such as steepness of slopes and seepage. Copies of inspections will be maintained at the site and should any potential hazards be observed, the Division shall be notified and remedial action taken. The coal processing waste piles shall be spread in layers no more than 24 inches in thickness; however, because of the nature of this "boney" material and its size (5 to 8 inches in diameter) compaction is not possible. Observations will be made regarding stability of the pile. This section shall comply with UMC 817.81-.88. Andalex Resources' coal processing waste is very small in volume. Andalex's hydrologic studies have indicated that groundwater does not exist within a zone of impact created by this facility. Drainage from coal processing waste, until such time as the material is buried with four feet of the best available non-toxic and non-combustible material and revegetation has occurred, will report to sedimentation ponds as shown on the surface drainage map. Drainage from the pile is carried to Pond F via disturbed ditch D-17, which is sized to carry runoff from the pile from a 100 year - 6 hour event as required. (See Table IV-13). Slope protection will be provided as required and banks will have a minimum static safety factor of 1.5. In the unlikely event spontaneous combustion occurs within the coal processing waste pile, the fire will be extinguished through means of compaction which is standard operating procedure (not to imply that the waste pile will be compacted as it is built). All personnel at Wildcat Loadout are familiar with this procedure. No burned coal processing waste or coal refuse will be removed from the disposal area except if it is moved to another approved coal processing disposal area. Coal processing waste from the Wildcat Loadout will not be returned to underground mine workings.

This material has been tested according to requirements for acid and toxic-forming materials and the results of these tests have been submitted to the Division. The intention of the testing was to determine whether the material had any toxic or acid-forming characteristics. Our results show that this material may be used in fill situations within our approved permit area. It is Andalex's intention to use this material as substitute fill for the expansion plans at the Wildcat loadout. It is clear that this material will have to be reclaimed as a separate operation from an ordinary fill situation. Andalex has committed to covering this material with four feet of native fill prior to redistribution of topsoil. This refuse material, which is used in a fill situation, will be reclaimed separately and covered with native material. Andalex makes this commitment for all of the refuse material which is used as fill.

It should be emphasized that upon final reclamation any refuse material which has been used in a fill situation will be removed and placed in the approved refuse disposal area. It will not be reclaimed in-place.

It is estimated that there are presently approximately 54,500 cubic yards of coal waste material on site. Of this, approximately 10,000 cubic yards of material were used in fills, and the remaining 44,500 cubic yards are in the refuse pile. *Additional refuse material will be used in the coal pad expansion described in Appendix S, 2007 Modification Plan*

R645-301-512.240. IMPOUNDMENTS

There are a total of eight (8) impoundments located at this site. This consists of six sediment ponds (C, E, F, G, H, and I), and two impoundments (Permanent Impoundment and Depression Area). Under the 2007 Modification Plan previous sediment ponds A, B, and D will be eliminated and replaced with new sediment ponds G, H and I. Existing sediment ponds E and F will also be enlarged to accommodate the new drainage system. Existing sediment pond C and the Permanent Impoundment and Depression Area will not be altered.

All sediment ponds are sized to contain the runoff from a 10 year-24 hour precipitation event, plus 3 years of sediment storage. A combination of primary and emergency overflows are also provided on each sediment pond, and each is sized to safely convey the runoff from a 25 year-6 hour precipitation event, as required. The Permanent Impoundment and Depression Area are each sized to contain the runoff from a 100 year-6 hour precipitation event. The Permanent Overflow is also equipped with a primary and emergency overflow, each sized to convey runoff from a 100 year-6 hour precipitation event. The Depression Area is an area used mainly for coal storage adjacent to the Utah Railway embankment. There are no culverts or overflows from this area.

Complete sizing and design details for all impoundments are included in Appendix R, "Wildcat Loadout Sedimentation and Drainage Control Plan". All impoundments are shown on Plates 2 and 15. Impoundment plans and details are shown on Plates 3A through 3H.

All sediment ponds are considered temporary and will be removed upon final reclamation. The Permanent Impoundment and Depression Area are sized to contain the 100 year event, and are considered permanent structures.

*******NOTE TO REVIEWS: THE FOLLOWING TEXT IS TO BE REMOVED FROM CHAPTER 5 AND IS REPLACED IN ITS ENTIRETY IN NEW APPENDIX R.**

"SEDIMENTATION AND DRAINAGE CONTROL PLAN"*****

~~Please note that this section also addresses all, or relevant portions of, the following main sections in Chapter 7.~~

~~— R645-301-722, 723, 724, 725, 728, 731, 732, 733, 734, 740, 741, 742, 743, 744, 752, 753, 763 and 764. —~~

~~The Sedimentation and Drainage Control Plan has been designed according to OSM regulations and the design criteria and construction certified by a Utah Registered Professional Engineer. No other embankments or other impoundments have been built nor are any proposed except similar sedimentation control structures at the facility.~~

~~There are six sedimentation ponds constructed at the Wildcat loadout Site. The pond locations are shown on Plate 2 and each pond is detailed on Plates 3 through 7. An additional 2-celled pond called the Permanent Impoundment is also constructed. This impoundment is meant to capture only natural drainage from the canyon above.~~

~~All ponds are constructed with proper embankment slopes, each is equipped with a principal and emergency spillway. All ponds are presently adequate for the design runoff from a 10 year — 24 hour precipitation event (or larger). —~~

~~The disturbed area draining to the ponds has been divided into a series of sub-drainages designated A through F. Runoff from each of these sub-drainages is directed to the corresponding pond via surface flow paths (ditches) and culverts as shown on Plate 2. One area of disturbance, in the northwest corner of the permit area, is an old stockpile area and is a large depression. This area is shown on Plates 1 and 2. The area does not drain and does not receive runoff except for direct precipitation and a small amount of undisturbed runoff from the hillside to the northwest as shown on Plate 2; therefore, it is not included in any of the pond sizing calculations.~~

~~There are seven small areas on the site which do not drain to the sediment ponds. These areas are all equipped with alternate sediment control consisting of straw bales, berms and/or vegetation. The areas are designated ASCA Areas and are shown on Plate 2. Complete descriptions of each of the areas is provided in this chapter. —~~

~~All sediment ponds are sized to contain the complete runoff from a 10 year — 24 hour precipitation event. If ponds need to be dewatered, this will be accomplished by a small pump or siphon, in accordance with the discharge permit. The ponds meet a~~

~~theoretical detention time of at least 24 hours, since they will totally contain runoff from the 10 year - 24 hour event without overflow and any release from the pond is at the discretion of the operator, after a 24 hour settling period. All ponds are covered by a UPDES Discharge Permit.~~

~~Maximum sediment levels for each pond is shown on the corresponding Plates 3 through 7. Each pond will be equipped with a sediment marker (as shown). The marker will consist of a steel rod or pipe painted with a red stripe to delineate the maximum sediment accumulation level in each pond.~~

~~Certifications of the design and construction inspections are provided in Appendix H.~~

~~Ponds will be inspected on a quarterly basis for safety, condition, and operation, and results recorded at the office for inspection.~~

~~All ponds are temporary and will be removed in two phases during final reclamation with the exception of the Permanent Impoundment, shown on Plate 2. During Phase I, Ponds B and E will be removed. This will occur during initial reclamation and revegetation of the property. Ponds A, C, D, and F will remain in place until revegetation standards are reached on the reclaimed site. At that time, during Phase II, all ponds will be removed except for the Permanent Impoundment and the pond areas reclaimed.~~

~~R-69 forms for each of the sediment ponds have been submitted to the State Engineer, as required. Copies of the forms are included in Appendix H of this plan.~~

~~All ponds have been constructed according to the design criteria under "Construction Specifications for Sedimentation Ponds".~~

~~Construction Specifications for Sedimentation Ponds~~

~~The following design criteria were used in the construction of all sedimentation ponds at the Wildcat Loadout. The certifications found in Appendix H reflect these design criteria.~~

~~All construction of sedimentation ponds will be performed under the direction of a qualified registered professional engineer.~~

~~Dams shall be constructed with primary overflows a minimum of two feet from the top, and emergency overflows at least one foot from the top.~~

~~The areas of pond construction shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.~~

~~In areas where fill is to be placed, natural ground shall be removed for at least 12" below the base of the structure.~~

~~Native materials will be used where practical. Fill will be placed in lifts not to exceed 15" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.~~

~~Rip-rap or other protection (belting, culverts, etc.) will be placed at all inlets and outlets to prevent scouring. Rip-rap will consist of substantial (non-slaking) rock material of 6" or greater size.~~

~~Each pond shall be fitted with an inverted inlet to the primary overflow, to prevent the passage of oil into the discharge.~~

~~Slopes of the dams shall not be steeper than 2h:1v, inside and outside, with a total of the inslope and outslope not less than 5:1.~~

~~Tops and external slopes of the dams shall be planted with an approved seed mix to prevent erosion and promote stability. Compaction of the slopes shall be at least 95%.~~

~~Top width of dams shall be not less than $(H + 35)/5$.~~

~~Design Parameters~~

~~Precipitation~~

~~The precipitation -- frequency values for the area were taken from "NOAA, Precipitation -- Frequency Atlas of the Western U.S., Volume 6".~~

Frequency	Duration	Precipitation
10 year	24 hour	1.85"
25 year	24 hour	2.15"
100 year	24 hour	2.75"
100 year	6 hour	1.91"

Flow

Flows for the property were calculated using the SCS-TR55 Method as described on page 114 of "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983. Peak discharge in CSM per inch of runoff was taken from Figure 2.40, page 115 of that same reference.

Time of concentration of storm events was calculated for each sub-drainage using the following formula:

$$t_e \text{ (hrs.)} = L^{0.6} (S+1)^{0.7} / 1900 y^{0.5}, \quad t_e = 0.6 t_c$$

where: t_c = Time of concentration (hrs.)
 t_e = Lag Time (hrs.)

L = Hydraulic Length of Watershed
(ft.)
 y = Average Land Slope (%)
 $S = 1,000 / \text{CN}$

Estimated Return Periods for Short Duration Precipitation in Utah U.S.U., page 53

Velocity

Flow velocities for each sub-drainage were calculated using Manning's Formula:

$$V = 1.49 R^{2/3} S^{1/2} / n$$

where: v = Velocity in feet per second
 r = Hydraulic radius in feet
 s = slope in feet per foot
 n = Manning's n ; Table 3.1, page 159, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner & Haan, 1983.

Small Drainage Ditches 0.025*
Corrugated Metal Pipe 0.025

*Based on DOGM recommendation.

Areas

~~All areas were planimetered directly from the Watershed Map, Plates 2 and 15.~~

Slopes

~~All slopes were measured directly from the topography on the Watershed Map, Plates 2 and 15.~~

Runoff

~~Runoff was calculated using the SCS formula:~~

$$\frac{Q}{P+0.8S} = \frac{(P-0.2S)^2}{P+0.8S}$$

~~where: Q = Runoff in inches
P = Precipitation in inches
S = 1,000 - 10
CN
CN = Runoff curve number~~

~~note: A runoff curve number of 90 was used for all disturbed areas. This is a conservative number based on the SCS determinations for Runoff Curve Numbers for Antecedent Moisture Condition II. A runoff curve number of 65 was used for undisturbed areas. this number is based on the SCS determinations for Runoff Curve Numbers for Antecedent Moisture Condition II, Soil Group B, Range Land in Fair to Good Condition.~~

~~The selection of the curve number is also based on field observations and subsequent discussions with DOGM personnel.~~

~~The native soil in the area is quite sandy and porous in nature, resulting in a relatively low runoff potential. This was the basis for the selection of SCS Soil Group B.~~

~~The runoff numbers were also checked against the chart in Figure 2.26, page 85, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner, and Haan, 1983.~~

Sediment Yield

~~The Universal Soil Loss Equation (USLE) was used to estimate sediment yield from disturbed areas. All soil loss from~~

~~disturbed sub areas was assumed to be delivered to, and deposited in the respective ponds.~~

~~Erosion rate (A) in tons per acre per year is determined using the USLE as follows:~~

$$\text{---} A = (R)(K)(LS)(CP) \text{---}$$

~~The variables R, K, LS, and CP are defined as follows:~~

~~Variable "R" is the rainfall factor which can be estimated from $R = 27P^{2.2}$, where P is the 2 year, 6-hour precipitation value. P for the Gordon Creek Area is 0.85 inches as shown on Figure 5.4, page 315, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner, and Haan, 1983. Therefore, the estimated value of "R" for this area is 18.88.~~

~~Variable "K" is the soil erodibility factor. For disturbed areas, the "K" value was conservatively estimated to be 0.5. This value is representative of compacted disturbed areas such as roads, embankments, and parking areas.~~

~~Variable "LS" is the length-slope factor. This figure was determined by applying the slope length and percentage for each sub-drainage area to the chart in Figure 5.15, page 334, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner, and Haan, 1983.~~

~~Variable "CP" is the control practice factor, which can be divided into a cover and a practice factor. For purposes of these calculations, no cover or control practice was assumed, and therefore, the "CP" factor was used as the maximum value of 1.~~

~~The results of the sediment yield calculations are summarized on Table V-4, Sediment Yield. A unit weight of 100 pounds per cubic foot was used to convert sediment yield to volume capacity requirements. Sediment storage values shown on the Sediment Pond Specification Tables are for a 3-year period.~~

~~Pond Volumes~~

~~All pond volumes shown in the Sediment Pond Specification Tables are from measurements taken directly from the "As Constructed" drawings of the sediment ponds, Plates 3 through 7 and Plate 18. Areas of the top and bottom of the ponds were planimetered, and depths were measured directly.~~

~~The following tables will summarize the drainage areas, sediment yield, and sediment pond specifications. Methods of calculations are detailed in Design Parameters.~~

~~STAGE VOLUME DATA~~
~~FOR~~
~~DEPRESSION AREA~~

Elevation	Area (ft.²)	Volume (ac. ft.)	Accum. Volume (ac. ft.)
6172 (Bottom)	4,500		
6174	46,000	1.16	1.16
6176 (Top)	121,000	3.83	4.99

~~Note: Water would impound to an elevation of 6,178 before actually going over the track area. This would increase the total storage volume by an additional 6.54 acre feet, allowing for an absolute maximum of 11.53 acre feet of storage before discharging. The 6,176 elevation used would not result in damage.~~

TABLE V-2

Drainage Areas/Flow Calculations

Drainage	Area	Length	Elev. Diff.	Slope	tc	Q
Area	(acres)	(ft.)	(ft.)	(%)	(hrs)	(cfs)
A	7.85	800	38	4.75	0.14	6.96
B	2.29	600	18	3.27	0.14	2.03
C	18.03	1200	52	4.33	0.21	15.31
D	6.61	400	18	4.50	0.08	6.45
E	7.69	1250	52	4.16	0.22	6.50
F	7.50	1200	38	3.17	0.24	6.26

TABLE V-2A

Post-Mining
Drainage Areas/Flow Calculations

Drainage	Area	Length	Elev. Diff.	Slope	tc	Q
Area	(acres)	(ft.)	(ft.)	(%)	(hrs)	(cfs)
A	10.14	800	38	4.75	0.14	14.26
C	30.59	1200	52	4.33	0.21	37.04
D	8.04	1250	52	4.16	0.22	9.42
F	7.50	1200	38	3.17	0.24	8.79

TABLE V-3

~~Runoff Calculations~~

Area/Pond	A	B	C	D	E	F
Drainage Area (ac.)						
Precipitation	7.85	2.29	18.03	6.61	7.69	7.50
10 yr. 24 hr. (in.)	1.85	1.85	1.85	1.85	1.85	1.85
25 yr. 24 hr. (in.)	2.15	2.15	2.15	2.15	2.15	2.15
100 yr. 24 hr. (in.)	2.75	2.75	2.75	2.75	2.75	2.75
Runoff CN	90	90	90	90	90	90
Runoff to Pond:						
10 yr. 24 hr. (ac. ft.)	0.654	0.191	1.503	0.551	0.641	0.625
25 yr. 24 hr. (ac. ft.)	0.820	0.239	1.883	0.690	0.803	0.783
100 yr. 24 hr. (ac. ft.)	1.143	0.333	2.624	0.962	1.119	1.092
Peak Flow:						
10 yr. 24 hr. (cfs)	6.96	2.03	15.31	6.45	6.50	6.26
25 yr. 24 hr. (cfs)	8.72	2.54	19.29	8.04	8.20	7.90

TABLE V-3A

~~Post Mining~~
~~Runoff Calculations~~

Area/Pond	A	C	D	F
Drainage Area (ac.)	10.14	30.59	8.04	7.50
10 yr. - 24 hr. (in.)	1.85	1.85	1.85	1.85
25 yr. - 24 hr. (in.)	2.15	2.15	2.15	2.15
Runoff CN	90	90	90	90
Runoff to Pond:				
10 yr. - 24 hr.				
(ac. ft.)	0.845	2.549	0.670	0.625
25 yr. - 24 hr.				
(ac. ft.)	1.059	3.193	0.839	0.783
Peak Flow:				
10 yr. - 24 hr.				
(ac. ft.)	14.26	37.04	9.42	8.79
25 yr. - 24 hr.				
(ac. ft.)	17.11	44.45	11.31	10.93

TABLE V-4

Sediment Yield

Area/Pond	A	B	C	D	E	F
Area (ac.)	7.85	2.29	18.03	6.61	7.69	7.50
Length	800	600	1200	400	1250	1200
Slope (%)	4.75	3.27	4.33	4.50	4.16	3.17
LS Factor	1.30	0.56	1.30	0.85	1.30	0.60
Sed. Yield (tons/ ac/yr.)	12.27	5.29	12.27	8.02	12.27	5.664
Unit Weight (lbs./ ft. ³)	100	100	100	100	100	100
Sed. Yield (ac. ft./yr.)	0.044	0.006	0.102	0.024	0.043	0.019
Sed. Yield (ac. ft./3 yrs.)	0.132	0.018	0.306	0.072	0.129	0.057

Note: Calculations based on Universal Soil Loss Equation

R = 18.88 inches

K = 0.5

CP = 1

TABLE V-4A

Post-Mining
Sediment Yield

Area/Pond	A	C	D	E
Area (ac.)	10.14	30.59	8.04	7.50
Length (ft.)	800	1200	1250	1200
Slope (%)	4.75	4.33	4.16	3.17
LS Factor	1.30	1.30	1.20	0.60
Sed. Yield (tons/ac./yr.)	12.27	12.27	11.33	5.664
Unit Wt. (lbs/ft. ³)	100	100	100	100
Sed. Yield (ac. ft./yr.)	0.057	0.172	0.042	0.019
Sed. Yield (ac. ft./3 yrs.)	0.171	0.516	0.126	0.057

Note: Calculations based on Universal Soil Loss Equation

R = 18.88 inches

K = 0.5

CP = 1

TABLE V-5

~~Direct Precipitation to Ponds~~

Pond	A	B	C	D	E	F
Precipitation (in.):						
10 yr. 24 hr.	1.85	1.85	1.85	1.85	1.85	1.85
25 yr. 24 hr.	2.15	2.15	2.15	2.15	2.15	2.15
100 yr. 24 hr.	2.75	2.75	2.75	2.75	2.75	2.75
Surface Area (ac.)	0.66	0.13	0.86	0.29	0.17	0.18
Precipitation to Ponds (ac. ft.):						
10 yr. 24 hr.	0.055	0.011	0.072	0.024	0.031	0.015
25 yr. 24 hr.	0.069	0.014	0.090	0.030	0.039	0.019
100 yr. 24 hr.	0.096	0.019	0.125	0.042	0.055	0.026

~~TABLE V-5A~~

~~Post-Mining
Direct Precipitation to Ponds~~

Pond	A	C	D	F
Precipitation (in.):				
10 yr. - 24 hr.	1.85	1.85	1.85	1.85
25 yr. - 24 hr.	2.15	2.15	2.15	2.15
Surface Area (ac.)	0.66	0.86	0.29	0.18
Precipitation to Ponds (ac. ft.):				
10 yr. - 24 hr.	0.055	0.072	0.024	0.015
25 yr. - 24 hr.	0.069	0.090	0.030	0.019

TABLE V-6

Pond Volume Summary
(10 year - 24 hour event)

Pond	A	B	C	D	E	F
Runoff (ac. ft.)	0.654	0.191	1.503	0.551	0.641	0.625
Direct Precipitation	0.055	0.011	0.072	0.024	0.014	0.015
3 yr. Sed. Storage (ac. ft.)	0.132	0.018	0.306	0.072	0.129	0.057
Required Pond Vol. (ac. ft.)	0.841	0.220	1.881	0.647	0.784	0.697
Actual Pond Vol. (ac. ft.)	2.410	0.310	4.430	0.880	0.849	0.700
Excess Capacity (ac. ft.)	1.569	0.090	2.549	0.233	0.065	0.003

TABLE V-6A

Post-Mining
Pond Volume Summary
(10 year - 24 hour event)

Pond	A	C	D	F
Runoff (ac. ft.)	0.845	2.549	0.670	0.625
Direct Precip. (ac. ft.)	0.055	0.072	0.024	0.015
3 yr. Sed. Storage (ac. ft.)	0.171	0.516	0.126	0.057
Req'd Pond Volume (ac. ft.)	1.071	3.137	0.820	0.697
Actual Pond Volume (ac. ft.)	2.410	4.430	0.880	0.700
Excess Capacity (ac. ft.)	1.339	1.293	0.060	0.003

TABLE V-7

~~Pond Specification Summary
(10 year - 24 hour event)~~

Pond	A	B	C	D	E	F
Drainage Area						
(ac.)	7.85	2.29	18.03	6.61	7.69	7.50
Required Volume						
(ac. ft.)	0.841	0.220	1.881	0.647	0.784	0.697
Existing Volume						
(ac. ft.)	2.410	0.310	4.430	0.880	0.849	0.700
Excess Volume						
(ac. ft.)	1.569	0.090	2.549	0.233	0.065	0.003
*Sed. Cleanout						
Level (ft.)	2.50	0.75	3.50	1.25	0.50	0.50
Embankment Slopes						
(%)						
Inside	3:1	5:1	3:1	3:1	3:1	2:1
Outside	2:1	2:1	2:1	2:1	2:1	3:1
Overflow						
Structures:						
Principal	18"cmp	12"cmp	18"cmp	18"cmp	18"cmp	12"
cmp						
Emergency	1'x 4'	1'x 4'	18"cmp	18"cmp	1'x 4'	1'x 4'

~~* Sediment Cleanout Levels are based on 60% of sediment storage for 3 years plus excess pond volume~~

~~NOTE: In the event any of the ponds or the impoundment need to be decanted, Andalex will provide pumps.~~

~~TABLE V-7A~~

~~Permanent Impoundment~~

*Drainage Area	86.32 acres
10 year 24 hour event	1.85 inches
100 year 6 hour event	1.91 inches
Runoff Curve Number	65
Required Pond Volume (10/24)	0.70 ac. ft.
Required Pond Volume (100/6)	0.81 ac. ft.
** Upper Cell Volume	0.43 ac. ft.
** Lower Cell Volume	0.53 ac. ft.
Total Storage Volume	0.96 ac. ft.

~~NOTE: Ponds are adequate for the 10 year 24 hour event and the 100 year 6 hour event.~~

~~* Planimetered from Plate 15~~
~~** Planimetered from Plate 18~~

TABLE V-7B

Permanent Impoundment
Overflow Structures

Structure	Upper Cell		
	Primary	Emergency	Lower Cell
	18" CMP	18" CMP	Emergency Overflow
Drainage Area	86.32	86.32	86.32
10 yr.-24 hr. event (in.)	1.85	---	1.85
100 yr.-6 hr. event (in.)	---	1.91	1.91
Time of Conc. (hrs.)	0.50	0.50	0.50
Runoff Curve Number	65	65	65
Structure Slope (%)	5.00	5.00	4.00
Peak Flow (10/24)	6.67	---	6.67
Peak Flow (100/6)	---	7.70	7.70
Min. Structure Area (ft ²)	1.77	1.77	4.50
Req'd Area (10/24)	0.80	---	1.74
Req'd Area (100/6)	---	0.92	1.92
Velocity (fps)	8.34	8.37	4.02
Rip-Rap Req'd (Y/N)	Y	Y	N
* Rip-Rap D ₅₀	Belting	Belting	6"

* Rip-Rap D₅₀ based on Figure V-4.

~~Depression Area:~~

~~—— This area is located below the 2 celled Permanent Impoundment, between the Permanent Impoundment and the railroad tracks. The area receives a very small amount of water from direct precipitation, and would otherwise receive larger amounts of water only through overflow or failure of the Permanent Impoundment. Calculations show the Depression Area to have a capacity of 4.99 acre feet at an elevation 2' below the tracks — this is 616% of the capacity of the Permanent Impoundment requirements for a 100 year — 6 hour storm event. The Depression Area, however, does not have an overflow; therefore, the following monitoring and de-watering plan is proposed in the unlikely event of significant water accumulation:~~

- ~~—— (1) Monitoring — A steel post will be set at the low point of the depression area. This post will be marked at an elevation of 2' above ground level. This elevation will mark the point at which the area will be dewatered.~~
- ~~—— (2) Dewatering — If water should accumulate to the mark on the monitoring post, the area will be dewatered using the pump system approved for decanting the sediment ponds on the property.~~

~~Diversion Structures~~

~~Flow within the disturbed area is diverted to the ponds by the use of ditches and culverts. These are temporary structures and will be removed on final reclamation of the site. Undisturbed drainage runoff is diverted around the site by existing channels as shown on Plate 2. These existing channels are permanent and will not be disturbed nor reclaimed during the life of this facility. Since Andalex does not intend to re-establish the drainage through the facility and under the railroad tracks upon final reclamation, these channels will remain after final reclamation.~~

~~Undisturbed Diversions~~

~~UD-1 -- Undisturbed runoff from the west of the property is captured by a pre-existing diversion and conveyed to the south and east into the Garley Canyon Drainage. This diversion is shown on Plate 2 as UD-1. The natural drainage into which it drains is designated ND-2. This is a natural drainage and will not be maintained, disturbed, or reclaimed in connection with this operation. A typical section of UD-1 is shown in Figure V-1. This diversion was installed by a previous operator and is meant to replace the original channel through the area, which was rendered useless by the height of the Utah Railway grade. UD-1 intercepts undisturbed runoff from approximately 10.29 acres. This will become a permanent diversion, and as shown on Plate 15 and on Table V-12, will be capable of carrying runoff from a 100 year 6 hour event from this area. Andalex Resources, Inc. will maintain this diversion at the minimum cross-sectional area shown on Figure V-1.~~

~~It was previously proposed to extend UD-1 some 650 feet up the canyon to intercept the majority of the drainage, but during construction, it was determined not feasible due to topography, slope requirements and environmental destruction. The diversion has been pulled back to its original location, and the construction disturbance is being reclaimed.~~

~~Upper Diversion -- The farthest reach of the previous UD-1 extension intercepted a small natural drainage coming off the rim of the small canyon. To re-establish the drainage pattern, a berm will be constructed as recommended by the Division. The berm will be 4 feet high with a top width of 2 feet, 2:1 side slopes, and will utilize existing available riprap material on the upstream face. In addition, Andalex will commit to the use of additional erosion control measures approved by the Division if erosion becomes apparent on the upstream face of the berm. Details of the berm design are shown on Figure IV-1A. Upon completion of the berm, any areas disturbed by the construction~~

~~will be regraded and seeded according to the approved plan.~~

~~Lower Diversion - The mid-section of the previous UD-1 extension also blocked a natural drainage ditch. To re-establish the natural drainage pattern, the channel will be reconstructed through the blocked drainage ditch, as recommended by the Division. The channel will be 2 feet deep, 2 feet wide and will have side slopes of 2:1. Details of this channel design are shown on Figure IV-1B. Upon completion of the channel construction, any disturbance will be regraded, and the area will be reseeded according to the approved plan in the MRP.~~

~~Figure V-1~~

~~Undisturbed Diversion UD-1~~

~~Figure V-1A~~
~~Berm Details for Upper Diversion~~

~~Figure V-1B~~
~~Channel Details for Lower Diversion~~

Figure V-1C
Disturbed Flow Ditch
Typical Section

~~It is proposed to leave UD-1 as a permanent diversion for the following reasons:~~

- ~~1. The diversion has been in place for more than five years without any sign of failure or overflow;~~
- ~~2. The diversion was installed by others and is necessitated by the height of the Utah Railway grade to the east;~~
- ~~3. The original drainage, if restored, would drain into a large depression carved out for previous coal storage;~~
- ~~4. To restore the original channel would require a massive amount of non-available fill material, the installation of a large culvert beneath the Utah Railway, and a restored channel through the middle of the reclaimed loadout area;~~
- ~~5. The proposed, post mining diversion is adequately sized to convey the runoff from a 100 year - 6 hour and even a 100 year - 24 hour precipitation event.~~

~~Permanent Impoundment - The permanent impoundment shown on Plate 2 is a 2-celled structure that catches most of the main canyon drainage from the west. The upper cell is a vegetated basin constructed by a previous owner. Upon surveying the upper cell, it was determined to be inadequate to contain runoff from a 100 year - 6 hour event for the area; therefore, a second, lower cell was constructed in the fall of 1991. The structures were resurveyed after completion, and now have adequate capacity (0.96 acre feet) to fully contain the runoff from a 100 year - 6 hour event (0.81 acre feet).~~

~~The upper cell is fitted with two 18" cmp overflows, one for primary overflow and one for emergency overflow. These culverts pass beneath the road between the cells and discharge into the lower cell via erosion - protected channels. The lower cell is equipped with an adequately sized open-notch overflow, protected by rip-rap. This overflow is for emergency purposes only, and will be used only for discharge of runoff beyond the design event (100 year - 6 hour). Details of the "As-Constructed" Permanent Impoundment are shown on Plate 18. Volume calculations and requirements are summarized on Tables V-7A and V-7B.~~

~~Upon final reclamation of the area, the two 18" cmp culverts between cells will be replaced by an open-notch overflow of the same size and design of that existing in the lower cell. The area will be reseeded according to the approved methodology and specifications in the MRP. The 2-celled pond will then be left~~

~~inplace as a permanent feature and allowed to go through natural succession. The upper cell of the impoundment has been inplace since approximately 1971, and has never overflowed or breached since that time. The lower cell will simply add to that level of protection. Leaving the impoundment inplace will provide for wildlife enhancement as well as runoff protection, through the establishment of a permanent waterhole to capture runoff.~~

~~The permanent impoundment will meet the requirements of R645-301-552.200 to allow authorization by the Division, based on the following:~~

- ~~1. The quality of the water will be suitable for wildlife watering, since it will contain only natural runoff;~~
- ~~2. The level of water will vary directly with runoff events, evaporation, and usage;~~
- ~~3. The impoundment will be in an area of controlled public access; however, the area will not be restricted to wildlife use;~~
- ~~4. No diminution of water quality or quantity is expected from this impoundment — it will be strictly runoff water, which has been captured in this impoundment for many years prior to the filing of this permit;~~
- ~~5. The impoundment does not meet the criteria or size of MSHA 30 CFR 77.216 (a);~~
- ~~6. The size of the impoundment is adequate for wildlife watering;~~
- ~~7. The impoundment has been, and will continue to be, suitable for the post-mining land use, which is wildlife watering;~~
- ~~8. Perimeter slopes are stable and do not exceed 2v:1h. Slopes are vegetated, as is the inlet area for erosion protection;~~
- ~~9. The impoundment is mostly incised, and does not have outlet structures; however, no discharge is expected since the pond is well oversized for a 100 year — 6 hour event (See Table V-7A).~~
- ~~10. The impoundment shall be maintained as necessary during the mining operation;~~
- ~~11. The impoundment design and construction is certified by~~

~~a registered, professional engineer.~~

~~ND-1 Undisturbed runoff from the north and east is diverted through an existing drainage south of the main Gordon Creek Road. This is also a pre-existing drainage; however, this drainage is considered "natural", having been in existence for more than 20 years. The drainage shows signs of active erosion, typical of other natural drainages in this area; however, the source of the erosive flows is completely out of the area disturbed by the Wildcat Loadout. The drainage is ephemeral and flows southeast into the Garley Canyon Drainage (which shows similar signs of erosion from natural forces). This drainage is shown on Plate 2 as ND-2 (Natural Drainage 2). There are no plans to disturb, maintain, or reclaim these drainages in connection with this operation. The drainage ND-1 does pass through a culvert beneath the haul road. This culvert will be maintained and removed during reclamation, and the culvert area restored to natural conditions.~~

~~Upon final reclamation (Phase II) culverts C-33 and C-34 will be removed, and the drainage channels restored. Since both culverts are on undisturbed or natural drainage channels, it is proposed to establish a compatible channel dimension at the time of reclamation, since the channels will likely change in the interim. At the initiation of Phase I Reclamation, a typical cross section of the undisturbed diversion (UD-2) and natural channel (ND-1) will be established for 100' above and below the culverts. The restored channels will then be constructed (during Phase II) using the average dimension and area of the cross-sections as a minimum. Peak flows and velocities for the reconstructed drainages shall be those from Table IV-9A for culverts C-33 and C-34. The velocities indicate the expected flows to be marginally erosive; however, rip-rap protection will be provided through the area of reconstruction as described on Table V-14.~~

~~UD-2 Drainage from the Beaver Creek property to the west is collected in a ditch on their property, conveyed to the north and then west beneath their access road and the railroad. This drainage then goes through access road culvert C-33 and into the natural drainage ND-1, as shown on Plate 2. This drainage is from areas outside the control of Andalex, and is therefore considered undisturbed; however, Andalex will maintain culvert C-33 to ensure proper operation and protection of its access road. Beaver Creek has reconstructed the ditch and culverts on its property, and is expected to be responsible for maintenance of those structures.~~

~~Undisturbed Diversion UD-2 will convey drainage from a portion of Small Area Exemption 1 as shown on Plate 2. This drainage is~~

~~also from a portion of the Beaver Creek property which is unused and to which Beaver Creek has granted Andalex the right of use (see letter of agreement in Appendix B). This area drains approximately 2.30 acres through three culverts and also empties into access road culvert C-33 and to ND-1. Andalex has included this diversion within its permit boundary and agrees to maintain the culverts C-30, C-31, C-32 (and C-33), along with the diversion to provide for design flows as shown on Tables V-9A and V-12. Erosive protection will be provided for culvert C-33 as per specifications in Table V-14. Unless the B.L.M. and Utah Railway prefer a different scenario, the diversion will be left in place upon final reclamation.~~

~~The diversion will be maintained to the minimum cross-sectional area shown on Table V-12; however, shape and configuration may vary due to maintenance, regrading, etc.~~

~~UD-3 through UD-7 — The undisturbed diversions UD-3 through UD-7 are shown on Plate 2. These "diversions" are primarily natural drainage areas into which the various sediment ponds would discharge. The diversions are out of the area of operation and disturbance; however, since they may convey drainage from the site, they are considered diversions to the permit boundary.~~

~~There are no plans to disturb these diversions; however, Andalex will maintain the diversions to the extent necessary to assure they have required minimum flow areas and to prevent erosion. The diversions will be restored if necessary during final reclamation, when the sediment ponds are removed. The diversions may vary in size, depth, and configuration; however, they will be maintained to the minimum cross-sectional areas shown on Table V-12.~~

~~Diversions UD-3 and UD-4 have potentially erosive velocities as shown on Table V-12; therefore, these diversions will be fitted with rip-rap erosion protection according to the specifications on Table V-14.~~

~~Rip-rap size is based on velocities in Table V-12 and the rip-rap chart in Figure V-4. See Figure V-2A for typical section.~~

~~UD-8 — Undisturbed diversion UD-8 as shown on Plate 2 is a small diversion to carry natural runoff from the hillside to the northwest into the depression area. This diversion will be maintained to the minimum cross-sectional area shown on Table V-12. The depression area does not drain; however, it is more than adequate in size to contain runoff from this diversion and drainage area.~~

Culverts

~~There are 20 culverts located on the Wildcat Loadout Facility for drainage control. In addition, each pond uses culverts for principal spillways and two for emergency spillways. All culverts are shown on Plate 2; each is listed by number designation and size. The culverts, along with flow characteristics and sizing requirements, are summarized on the following tables, V-8 and V-9 Culvert Specifications. All culverts within a given drainage area are sized in accordance with the maximum peak flow calculated for that area. In addition, culverts noted for pond outlets are sized for peak flows from the respective drainage areas.~~

~~Culvert flow capabilities are based on the "Culvert Nomograph", Figure V-2.~~

~~Erosion protection requirements are discussed on Tables V-8 and V-9 and in this section under "Erosion Protection".~~

TABLE V-8

Drainage Culvert Specifications

Culvert	Size (in.)	Drainage Area	Design Flow (cfs)	Capacity Flow (cfs)	Velocity (fps)	Erosion Protec. (y/n)
C1	18	E	4.66	9.00	3.12	N
C2	24	E	4.66	18.00	1.76	N
C3	24	C	5.64	18.00	1.80	³ Y
C4	24	C	5.64	18.00	3.59	N
C4A	24	C	5.64	18.00	3.59	N
C4B	24	C	11.27	18.00	3.59	N
C5	12	C	2.82	3.20	3.59	N
C5A	12	C	2.82	3.20	3.59	N
C6	15	C	5.64	5.50	4.59	³ Y (emp)
C7	15	A	2.75	5.50	2.36	³ Y (rock)
C7A	12	A	2.75	3.20	3.50	N
C8	12	A	2.75	3.20	3.50	N
C9A	15	A	4.43	5.50	3.80	N (belt)
C10	12	B	3.22	3.20	4.10	N
C11	18	C	7.51	9.00	4.24	N
C12	18	E	4.66	9.00	2.63	N
C24	15	E	4.66	5.50	3.79	N
C25	15	E	4.66	5.50	3.79	N
C26	12	E	2.33	3.20	2.97	N
C27	12	A	2.75	3.20	3.50	N

¹Based on a minimum of H/D = 1.5 (See Figure V-2)

²Velocity based on $Q = AV$

Culverts on 3% Slope (minimum)

³Rip rap protection provided or required

⁴Erosion protection may prove to be required at any or all locations. Outfalls will be checked for erosion and protection provided as needed. A "Y" on Erosion Protection means protection will be provided "as necessary", to be determined by field inspections.

TABLE V-8 (con't)

Additional Notes

~~Flow in culvert C 4b is controlled by inlet conditions. The culvert is 400 feet long, and will be fitted with a trash rack at the inlet. The rack will consist of a steel frame 30" x 30" with 3/4" rebar (or steel rods) welded vertically on 4" centers.~~

TABLE V-9

Pond Culvert Specifications

Culvert	Size (in.)	Pond	Design	*Capacity	*Velocity (fps)	*Erosion Protection (y/n)
			Flow (cfs)	Flow (cfs)		
C13	18	A	6.96	11.00	3.94	Y
C14	12	B	2.93	4.00	2.59	Y
C15	18	C	15.31	11.33	8.66	Y
C16	18	C	19.29	22.00	10.92	Y
C17	18	D	6.45	11.00	3.65	Y
C18	18	D	8.04	22.00	4.55	Y
C19	18	E	6.50	11.00	3.68	Y
C20	18	F	6.26	*6.30	7.47	Y

*Based on headwater depth $H/D = 2.0$ (See Figure IV-2)

*Based on $V = Q/A$

Culverts on 3% Slope (minimum)

*Y on Erosion Protection means protection will be provided "as necessary", to be determined by field inspections.

*Based on $H/D=4.0$; adequate headwater depth available.

TABLE V-9A

~~Access Road and UD-2 Culverts~~
~~| **** | | | | | |
|---------|-------|----------|-------------|---------------|---------------|
| Culvert | Size | Drainage | Design Flow | Capacity Flow | Erosion Prot. |
| | (in.) | | (cfs) | (cfs) | (y/n) |
| C-30 | 15 | UD-2 | 0.67 | 5.51 | N |
| C-31 | 12 | UD-2 | 0.67 | 3.20 | N |
| C-32 | 24 | UD-2 | 0.67 | 18.00 | N |
| C-32A | 12 | UD-2 | 0.67 | 3.20 | N |
| * C-33 | 24 | UD-2 | 8.76 | 18.00 | Y |
| **C-34 | 36 | ND-1 | 32.39 | 48.50 | N |~~

~~* Access Road Culvert Includes drainage from UD-2 and 44.5 acres from Beaver Creek Property.~~

~~** Access (Haul) Road Culvert Runoff area planimetered from Plate 15.~~

~~*** Based on $V = Q/A$~~

~~**** 1.5 foot minimum headwall~~

~~NOTE: Y on Erosion Protection means protection will be provided "as necessary", to be determined by field inspections.~~

Figure V-2
Culvert Nomograph

~~Figure V-2A~~
~~Sediment Pond Outlet Protection~~

~~Figure V-2B~~

~~Typical Section of Emergency Spillways~~

~~Disturbed Flow Ditches~~

~~Disturbed area runoff is diverted to the ponds through a series of ditches and culverts as shown on Plate 2. The disturbed flow ditches are designated as D-1, D-2, ..., and the culverts are noted as C1, C2, ... The disturbed flow ditches will vary in depth and configuration; however, all ditches will be maintained at the minimum cross-sectional area shown on Table V-13, "Disturbed Flow Ditch Summary". A typical section of the Disturbed Flow Ditches is shown in Figure V-1C. As shown on Table V-13, most velocities are expected to be less than 5 fps, with the majority less than 4 fps. These velocities are considered moderately erosive, and as a result, erosion protection may prove to be necessary. Andalex will continue to observe potential erosion locations throughout the life of the loadout. Where erosion has become evident as demonstrated by observation, energy dissipators have been installed and erosion protection has been installed to reduce flow velocities, as discussed under Section 5 "Erosion Control" below.~~

~~To date energy dissipators have consisted of straw bales, spaced adequately to help control the erosion. More permanent energy dissipators are not proposed for the disturbed area ditches, due to the frequency of cleaning and regrading ditches.~~

~~Disturbed area diversions are designed, constructed, and maintained to prevent additional contributions of suspended solids to streamflow and to runoff outside the permit area. Appropriate gradients and energy dissipators as required, will be used to control sediment contributions. All diversions will be maintained with a minimum freeboard of at least 0.3 feet. Excess or cleaned material shall be disposed of in an approved refuse disposal area with material cleaned from the sediment ponds.~~

~~It should be noted that the junction of drainages to Ponds A, B, and C, shown on Plate 2, represent the "worst case" scenario for drainages to these points from this area. This is a coal pad area, and is in a constant state of change -- as a result, drainage patterns within the pad are subject to frequent change. Temporary ditches, such as the one recently placed in the Pond B drainage, may be placed to direct runoff over the short term; however, such ditches are only temporary and are likely to be changed or eliminated with changes in the pile.~~

~~One ditch, designated D-17, is located adjacent to the waste coal area, and will carry the runoff from this area to Pond F. Under the new regulations, this ditch must be sized to carry runoff from a 100 year -- 6 hour event; therefore, the calculations on Table V-13 reflect the 100 year -- 6 hour design for this ditch only. The calculated runoff is based on a 100 year -- 6 year~~

~~event of 1.91", a CN of 90 and an area of 1.47 acres for the refuse/waste coal area.~~

~~All ditches are shown on Plate 2.~~

~~Erosion Control~~

~~The majority of calculated velocities of culverts and ditches fall between 3 and 5 fps. Although it has been common practice to consider flows less than 5 fps as non-erosive, the Division has recommended that 3 fps be used on this site as the limit for non-erosive flow. Andalex will therefore commit to the following:~~

~~Constant observation of all ditches and in particular those which may have an erosive flow will be made periodically as well as following precipitation events to determine whether excessive erosion has occurred. Those ditches which may have an erosive flow according to the calculations are noted below:~~

Ditch D-3	Near Pond D Inlet
Ditch D-7	Near Pond C Inlet
Ditch D-9	Mid Point
Ditch D-11	Upper Portion of Ditch
Ditch D-13	Mid Point
Ditch D-14	Mid Point
Ditch D-17	Upper Portion of Ditch

~~Observations of these ditches were made periodically and following precipitation events. It was determined that erosion was going to be a constant problem in many of these ditches due to the nature of the soil material at Wildcat. Therefore, where erosion was consistently observed, the ditches were lined either with conveyor belt or half-round culvert. The following specific actions were taken after these observations were made. Diversion D-3 has shown erosion at the sedimentation pond inlet and therefore 24" half round culvert has been installed. Diversion D-7 has also shown erosion at the Sediment Pond C inlet and therefore 24" half round culvert has been installed. Erosion has not been noted in Diversion D-9; in fact, Diversion D-9 has to be regularly cleaned out. Similarly Diversion D-11 must be periodically cleaned; erosion has not been observed. Erosion has also not been observed in Diversion D-13 except at the inlet to Sediment Pond A where the inlet culverts now spill onto conveyor belting. Diversion D-14 is also periodically cleaned; erosion has not been noted. The same note may be made on D-14 regarding the Sediment Pond A inlet. Diversion D-17 is periodically cleaned; the erosion which was noted is at the inlet to Sediment Pond F where 24" half round culvert has been installed. Plate 2 reflects all of these installations. It should also be noted~~

~~that in addition to those ditches mentioned above, all pond inlets are equipped with erosion control. Also, Diversion D-1 has been lined entirely with 24" half round culvert. Diversion UD-1 near SAE 4 is equipped with 24" half round on one particularly steep slope. None of the other diversions have erosion problems but are cleaned periodically.~~

~~In addition, erosion protection is already in place at various culvert outlets and on disturbed ditch D-1 (see Plate 2). Rip-rap protection and specifications are summarized in Table V-14.~~

~~Erosion protection on diversions may consist of the following:~~

- ~~1. Rip-rap~~
 - ~~a. Installed per Table V-14.~~
- ~~2. Half round culverts or full culverts.~~
~~(See Plate 2)~~
- ~~3. Velocity Controls~~
 - ~~a. Straw Bales~~
- ~~4. Revegetation~~
- ~~5. Other proven or approved structures.~~
 - ~~a. Upon consultation with the Division.~~

~~Erosion protection is also provided at all pond emergency spillways as shown in Figure V-2B.~~

~~Inlets on Pond F (Plate 7) are equipped with conveyor belting below the half round culverts to aid in erosion protection.~~

~~The main form of erosion control used on the property in addition to half round culvert is revegetation. All topsoil piles, sediment pond embankments, and other disturbed areas no longer needed for the operation have been reseeded using an interim seed mix for this site.~~

~~Effects of Operation on Surface Water~~

~~Since this is a surface processing and loadout operation, no mining or extraction will be done at this site; therefore, the only effects from this operation on surface water would be from disturbed area runoff. The control plans described earlier in this chapter are designed to direct and control runoff and to prevent erosion as required by regulation. Adequate maintenance of these facilities will ensure proper operation and minimize effects on surface water.~~

~~Since the area on which the loadout facility is located was previously disturbed by another lessee, the implementation of approved drainage controls will likely have a positive effect on the quality of surface water within and below the permit area.~~

~~Mitigation and Control Plans~~

~~The permit area and adjacent area contain no renewable groundwater or surface water resources; therefore, water right protection or mitigation measures are not anticipated to be required at this operation. The sediment control structures are adequate to prevent impacts to the hydrologic regime. These structures will be maintained to function as designed for the life of the operation. Failure or malfunction of any of the control structures will be corrected as soon as practicable after discovery and any adverse impacts (erosion, structure damage, etc.) will be repaired as soon as practicable thereafter.~~

~~Water Monitoring Plans~~ (Also R645-301-722.300,
723, 724, 731.200)

~~Four surface water monitoring stations will be established as shown on Plate 15. Two of the stations will be located in undisturbed drainage above the site and two stations will be in the same drainages below the site. This configuration will show any affects of the operation on the drainage of the area.~~

~~Since this is a new permit and no baseline data has been gathered, the stations will be monitored according to the Baseline Criteria (parameters and frequency) listed in Table V-10, "Surface Water Baseline and Operational Water Quality Parameter List", for the first two years. After that time, the stations will be monitored according to the parameter and frequency requirements of the operational portion of Table V-10. Reclamation monitoring will also follow the requirements of the Postmining portion of Table V-11.~~

~~Water monitoring stations will be designated as WCW-1 through WCW-4 for surface monitoring points. In addition, each pond discharge will be monitored according to N.P.D.E.S. requirements. These station numbers will be designated WCW-A through WCW-F for Ponds A through F respectively (see Plates 2 and 15).~~

~~Monitoring results will be submitted to the Division quarterly, within sixty days following the end of the reporting quarter.~~

~~Samples will be collected during or shortly after precipitation events to establish baseline parameters.~~

~~Baseline monitoring will consist of eight samples analyzed for~~

~~the baseline chemical parameters on Table IV-10 (four per annum, collected quarterly during precipitation events). A rain gauge will also be installed at the site, and a log of precipitation events will be maintained on site.~~

~~It should be noted that Andalex and its designated laboratory will follow the "Standard Methods for the Examination of Water and Wastewater" for all of the above water samples.~~

TABLE V-10

~~Surface Water Baseline and Operational
Water Quality Parameter List~~

~~Field Measurements:~~

~~* Water Levels or Flow
* pH
* Specific Conductivity (umhos/cm)
* Temperature (C°)~~

~~Laboratory Measurements: (mg/l) IONS AND METALS ANALYSES ARE
DISSOLVED, EXCEPT AS NOTED~~

~~* Total Settleable Solids
* Total Suspended Solids
* Total Dissolved Solids
* Total Hardness (as CaCO₃)
* Acidity
Aluminum (Al)
Arsenic (As)
Barium (Ba)
Boron (B)
* Carbonate (CO₃⁻²)
* Bicarbonate (HCO₃⁻)
Cadmium (Cd)
* Calcium (Ca)
* Chloride (Cl⁻)
Chromium (Cr)
Copper (Cu)
Fluoride (F⁻)
* Iron (Fe) (TOTAL)
* Iron (Fe) (DISSOLVED)
Lead (Pb)
* Magnesium (Mg)
* Manganese (Mn) (Total)
* MANGANESE (MN) (Dissolved)
Mercury (Hg)
Molybdenum (Mo)
Nickel (Ni)
Nitrogen: Ammonia (NH₃)
Nitrate (NO₃⁻)
Nitrite (NO₂)
* Potassium (K)
Phosphate (PO₄⁻³)
Selenium (Se)
* Sodium (Na)
* Sulfate (SO₄⁻²)
Sulfide (S⁻²)~~

~~_____ Zinc (Zn)~~
~~_____ * Oil and Grease~~
~~_____ * Cation Anion Balance~~

~~Baseline~~ ~~*Operational~~

TABLE V-11

Surface Water Sampling

	Baseline	Operational	Postmining
Type of Sampling Site	Surface Water Bodies	Surface Water Bodies	Surface Water Bodies
Field Measurements (See Table V-10)	Performed during water level/flow measurements	Performed during water level/flow measurements	Performed during water level/flow measurements
Sample Frequency	Quarterly for lakes, reservoirs, and impoundments (water level and quality); monthly flow measurements and quarterly water quality measurements (one sample at low flow and high flow each) for perennial streams. Monthly flow and water quality measurements during period of flow for intermittent streams. Sampling for ephemeral streams determined at pre-design conference.	Quarterly for lakes, reservoirs, and impoundments (water level and quality); monthly flow measurements and quarterly water quality measurements (one sample at low flow and high flow each) for perennial streams. Monthly flow and water quality measurements during period of flow for intermittent streams. Sampling for ephemeral streams determined at pre-design conference.	Two per annum for perennial streams (high & low flow); two per annum during snowmelt and rainfall for intermittent streams.

TABLE V-11 (con't)

Surface Water Sampling

	Baseline	Operational	Postmining
Sampling Duration	Two years (one complete year of data before submission of PAP.	Yearly until two years after surface reclamation activities have ceased.	Until termination of bonding.
Type of Data Collected & Reported	Flow and/or water levels and water quality.	Flow and/or water levels and water quality.	Flow and/or water levels and water quality per operational parameters.
Comments	All field measurements should be performed concurrently with water level/flow measurements.	All field measurements should be performed concurrently with water level/flow measurements.	All field measurements should be performed concurrently with water level/flow measurements.
Comments		For every fifth year preceding re-permitting, one sample at low flow and and high flow each should be taken for base-line water quality parameters.	

TABLE V-12

Undisturbed Diversion Summary

Structure	UD-1	**UD-1	UD-2	*UD-3	*UD-4
	(Overall)	(Near			
		Pond F)			
Drainage Area (ac.)	10.29	10.29	2.30	6.61	18.03
10 yr. 24 hr. event (in.)	1.85	1.85	1.85	1.85	1.85
25 yr. 24 hr. event (in.)	2.15	2.15	2.15	2.15	2.15
100 yr. 24 hr. event (in.)	2.75	2.75	2.75	2.75	2.75
Time of Conc. (hrs.)	0.10	0.10	0.13		
Curve Number	65	65	65		
Manning's Number	.025	.032	.025	.025	.025
Ditch Slope (%)	4.00	7.00	6.67	13.85	12.86
Peak Flow/10 (cfs)	1.45	1.45	0.67	10.33	22.54
Peak Flow/25 (cfs)	3.05	3.05	1.00	12.84	28.02
Peak Flow/100 (cfs)	6.43	6.43	1.83	N/A	N/A
Min. Str. Area (ft. ²)	4.00	4.00	1.00	2.00	3.75
Req'd Area/10 (ft. ²)	0.37	0.19	0.16	0.94	1.71
Req'd Area/25 (ft. ²)	0.65	0.63	0.21	1.10	2.02
Req'd Area/100 (ft. ²)	1.13	1.10	0.34	N/A	N/A
Velocity (fps)	3.92	4.02	4.24	11.04	13.15
Hydraulic Length (ft.)	1600		400	N/A	N/A
Elev. Diff. (ft.)	64		16	N/A	N/A
Channel Bottom Width (ft.)	0.10	0.10	0.10	0.10	1.00
Channel Top Width (ft.)	6.00	6.00	2.00	3.00	4.00
Channel Depth (ft.)	1.50	1.50	1.00	1.50	1.50
Flow Depth/10 (ft.)	0.41	0.40	0.35	0.59	0.90
Flow Depth/25 (ft.)	0.54	0.54	0.41	0.66	1.01
Flow Depth/100 (ft.)	0.73	0.72	0.53	N/A	N/A

* — Ditches conveying sediment pond outflow to natural drainage.

** — Erosion controlled portion of diversion — may be fitted with rip-rap or 1/2 — round, 24" cnp culvert.

TABLE V-12 (con't)

~~Undisturbed Diversion Summary~~

Structure	*UD-5	*UD-6	*UD-7	UD-8
Drainage Area (ac.)	2.29	7.85	7.50	13.79
10 yr. 24 hr. event (in.)	1.85	1.85	1.85	1.85
25 yr. 24 hr. event (in.)	2.15	2.15	2.15	2.15
100 yr. 24 hr. event (in.)	2.75	2.75	2.75	2.75
Time of Conc. (hrs.)				0.10
Curve Number				65
Manning's Number	.025	.025	.025	.025
Ditch Slope (%)	6.67	10.00	11.25	2.00
Peak Flow/10 (cfs)	3.22	11.03	8.79	4.31
Peak Flow/25 (cfs)	4.00	13.71	10.93	6.46
Peak Flow/100 (cfs)	N/A	N/A	N/A	N/A
Min. Str. Area (ft.²)	2.00	2.00	2.00	2.00
Req'd Area/10 (ft.²)	0.52	1.11	0.90	1.00
Req'd Area/25 (ft.²)	0.61	1.30	1.05	1.35
Req'd Area/100 (ft.²)	N/A	N/A	N/A	N/A
Velocity (fps)	6.15	10.54	9.80	4.30
Hydraulic Length (ft.)	N/A	N/A	N/A	300
Elev. Diff. (ft.)	N/A	N/A	N/A	80
Channel Bottom Width (ft.)	1.00	1.00	1.00	1.00
Channel Top Width (ft.)	3.00	3.00	3.00	3.00
Channel Depth (ft.)	1.00	1.00	1.00	1.00
Flow Depth/10 (ft.)	0.38	0.66	0.57	0.62
Flow Depth/25 (ft.)	0.43	0.75	0.64	0.77
Flow Depth/100 (ft.)	N/A	N/A	N/A	N/A

~~* Ditches conveying sediment pond outflow to natural drainage.~~

TABLE V-13
Disturbed Flow Ditch Summary

Ditch	Min. X Sect. Area (ft. ²)	Drainage Area	Design Flow (cfs)	Slope (%)	Velocity (fps)
D-1a	1.00	E	2.33	3.33	4.44
D-1b	1.00	E	2.33	2.50	3.99
D-1c	1.96	E	4.66	2.54	4.76
D-1d	1.00	E	2.33	3.75	4.64
D-1	1.96	E	4.66	5.20	6.23
D-2	1.96	E	4.66	3.33	5.27
D-3	1.96	D	5.16	4.00	5.79
D-4a	1.96	C	5.64	2.80	5.18
D-4	1.96	C	5.64	8.00	7.68
D-5a	1.96	C	2.82	2.00	3.84
D-5b	1.96	C	2.82	2.00	3.84
D-5	1.96	C	5.64	4.55	6.21
D-6	1.69	C	2.82	2.67	4.28
D-7	1.00	C	2.82	5.33	5.56
D-8	1.00	C	2.82	3.66	4.82
D-9	1.96	C	5.64	2.85	5.21
D-10a	1.00	A	1.87	2.00	3.47
D-10	1.69	A	1.87	1.00	2.67
D-11a	1.00	A	1.87	2.00	3.47
D-11	1.00	A	1.87	6.67	5.46
D-12	1.96	A	2.75	1.67	3.57
D-13	2.16	A	4.43	2.62	4.72
D-15	1.69	B	3.22	3.57	4.94
D-16	1.00	B	1.61	3.00	3.90
D-17a	1.00	F	2.20	3.28	4.35
D-17	1.96	F	4.40	2.50	4.66
D-18	1.96	F	4.40	2.45	4.63
D-15T*	1.69	B	3.22	3.57	4.94

Note: (1) Velocities are based on Manning's Formula:

$$V = 1.49 R^{2/3} S^{1/2}$$
where

$$n$$

$n = 0.025$, $s = \text{slope ft./ft.}$

(2) Erosion protection may prove necessary for any or all ditches. Erosion will be monitored and protection provided as necessary.

(3) See Figure IV-1C for typical ditch section.

* Temporary Ditch

TABLE V-13 (Con't)
Undisturbed Flow Ditch Summary

Ditch	Bottom Width (ft.)	Top Width (ft.)	Channel Depth (ft.)	Flow Depth (ft.)	Erosion Protection Y/N
D-1a	0.10	2.00	1.00	0.68	Y
D-1b	0.10	2.00	1.00	0.72	N
D-1c	0.10	2.80	1.40	0.94	Y
D-1d	0.10	2.00	1.00	0.66	Y
D-1	0.10	2.80	1.40	0.82	Y
D-2	0.10	2.80	1.40	0.89	Y
D-3	0.10	2.80	1.40	0.90	Y
D-4a	0.10	2.80	1.40	0.99	Y
D-4	0.10	2.80	1.40	0.81	Y
D-5a	0.10	2.80	1.40	0.81	N
D-5b	0.10	2.80	1.40	0.81	N
D-5	0.10	2.80	1.40	0.90	Y
D-6	0.10	2.60	1.30	0.76	Y
D-7	0.10	2.00	1.00	0.66	Y
D-8	0.10	2.00	1.00	0.72	Y
D-9	0.10	2.80	1.40	0.99	Y
D-10a	0.10	2.00	1.00	0.69	N
D-10	0.10	2.60	1.30	0.79	N
D-11a	0.10	2.00	1.00	0.69	N
D-11	0.10	2.00	1.00	0.54	Y
D-12	0.10	2.80	1.40	0.83	N
D-13	0.10	3.00	1.50	1.00	Y
D-14	0.10	2.80	1.40	0.93	Y
D-15	0.10	2.60	1.30	0.76	Y
D-16	0.10	2.00	1.00	0.59	N
D-17a	0.10	2.00	1.00	0.66	Y
D-17	0.10	2.80	1.40	0.92	Y
D-18	0.10	2.80	1.40	0.93	Y
D-15T	0.10	2.60	1.30	0.76	N/A

TABLE V-13A

Post-Mining Ditch Summary

Min.							
X Sect.	Drainage	Design	Capacity	Erosion			
Ditch	Area	Area	Flow	Flow	Slope	Vel.	Prot.
(ft.²)	(cfs)		(cfs)	(cfs)	(%)	(fps)	(y/n)
RD-1	4.00	D	9.42	30.24	6.67	7.56	Y
RD-2	4.00	D	9.42	20.92	3.20	5.23	Y
RD-3	4.00	*C	9.26	37.00	10.00	9.25	Y
RD-4	4.00	*C	18.52	37.00	10.00	9.25	Y
RD-5	4.00	*C	9.26	25.52	4.76	6.38	Y
RD-6	4.00	A	14.26	29.28	6.25	7.32	Y
RD-7	4.00	F	8.79	26.84	5.26	6.71	Y
RD-8	4.00	F	8.79	35.28	9.09	8.82	Y

Notes:

* 1/4 Drainage Area "C" Runoff

* 1/2 Drainage Area "C" Runoff

* Velocities based on Manning's Formula:

$$V = \frac{1.49 R^{2/3} S^{1/2}}{n}, \text{ where}$$

n = 0.032 (Rip-rap), s = slope in ft./ft.

TABLE V-14

Rip-Rap Specifications

Structure	Rip-Rap Size (in.)			Minimum	Filter Blanket
	D15	D50	D85	Depth (in.)	Depth (in.) (-3/4" Gravel)
UD-1 (Berms)	3.75	9.00	14.50	13.5	13.5
UD-1 (New Pond F)	7.50	18.00	28.75	27.0	27.0
UD-2 (C-33)	2.50	6.00	9.50	9.0	9.0
ND-1 (C-34)	2.50	6.00	9.50	9.0	9.0
UD-3 (Outfall)	7.50	18.00	28.75	27.0	27.0
UD-4 (Outfall)	10.00	24.00	38.50	36.0	36.0
C-6	2.50	6.00	9.50	9.0	9.0
C-9B	2.50	6.00	9.50	9.0	9.0
C-13 thru C-20	3.75	9.00	14.50	13.5	13.5
*D-1C	2.50	6.00	9.50	9.0	9.0
**D-1	2.50	6.00	9.50	9.0	9.0
*D-3	2.50	6.00	9.50	9.0	9.0
*D-4a	2.50	6.00	9.50	9.0	9.0
*D-4	3.75	9.00	14.50	13.5	13.5
*D-5	2.50	6.00	9.50	9.0	9.0
*D-7	2.50	6.00	9.50	9.0	9.0
*D-9	2.50	6.00	9.50	9.0	9.0
*D-11	3.75	9.00	14.50	13.5	13.5
*D-13	2.50	6.00	9.50	9.0	9.0
*D-14	2.50	6.00	9.50	9.0	9.0
*D-17	2.50	6.00	9.50	9.0	9.0
*D-18	2.50	6.00	9.50	9.0	9.0
RD-1 Thru RD-8	5.00	12.00	19.25	18.0	18.0

* To be installed only if erosion is evident. Other erosion protection may also be provided, such as half round culverts, belting, downspouts, etc.

** Conveyor Belting presently used.

~~Other Sediment Control -- ASCA~~

~~All topsoil piles are equipped with berms and have been revegetated. Andalex will not allow any topsoil pile to report directly to a sedimentation pond. This would result in a loss of topsoil material. The areas around these topsoil piles have been graded and revegetated to prevent erosion. A straw dike has been placed downstream from Pond B to prevent waterborne coal fines from leaving the permit area. This dike will be maintained throughout the life of the project.~~

~~There are seven (7) small areas which do not drain to sedimentation ponds (alternate sediment control areas (ASCA)). These are designated ASCA and all are shown on Plate 2. The areas each have an alternate sediment control method, consisting of strawbales, berms, vegetation or a combination of each. The total ASCA for this site is 17.51 acres or 26.07% of the total disturbed area. Drainage from each of these areas will be monitored for compliance with State and Federal limitations, to the extent possible. This will be accomplished by attempting to collect samples (as available) from points of discharge below the strawbales or other sediment controls. Topsoil piles with earth berms, which are ASCA's, will also be designed so that water will not be impounded. That is, berms will be notched so that water can flow through the notch. The straw berm will be placed in the notch and will function as alternate sediment control. The topsoil piles have berms only so that topsoil in the piles will not be lost.~~

~~Strawbales are placed on the ground to prevent undercutting or routing of flows around the bales. Berms and bales are maintained on a regular basis and cleaned, repaired or changed out as needed. All control structures will be removed upon final reclamation of the site.~~

~~Table V-15 is a summary of each of the ASCA along with size, runoff volume and treatment methods.~~

TABLE V-15

ASCA

ASCA	Area	*Runoff Volume	Treatment
Area*	(Acres)	(ac. ft.)	Method
1	0.84	0.07	Vegetation
2	0.44	0.04	Vegetation
3	9.98	0.84	Straw Bales/Vegetation
4	3.42	0.29	Straw Bales/Vegetation
5	2.00	0.17	Straw Bales/Vegetation/Berm
6	0.57	0.05	Vegetation
7(F)	0.26	0.02	Vegetation/Berm
Totals	17.51	1.48	

*Runoff Volumes are based on a 10 year - 24 hour event and a runoff CN of 90.

~~Post Mining Hydrology~~

~~Introduction~~

~~The purpose of this section is to describe the plan for control of the permit and adjacent area hydrology during and after reclamation until bond release.~~

~~Methodology~~

~~The plans herein described are based on requirements of the regulations and on proven, accepted reclamation techniques used in the Carbon Emery area. The post-reclamation hydrology is designed to protect the reclaimed site from erosion, to protect the hydrologic regime from adverse impacts, and to meet requirements of DOGM and the landowner, BLM.~~

~~Reclamation Hydrology~~

~~Upon completion of operations, all structures will be removed and the area will be recontoured as shown on Plate 8. All culverts and unnecessary ditches and ponds will be removed at that time. The post-reclamation drainage will be as shown on Plates 8 and 9.~~

~~Undisturbed diversions will remain in place, since these were installed prior to the operation, and they have been shown to be adequate to carry a 100 year, 24 hour precipitation event.~~

~~Sedimentation Ponds A, C, D, and F will remain in place until revegetation standards are reached (Phase I). At that time, the ponds will be removed and reclaimed (Phase II). Disturbed drainage flow paths will be reconstructed during reclamation to direct reclaimed area runoff to the various ponds. The reconstructed flow paths are shown on Plates 8 and 9, and are designated RD-1, RD-2, ... for Reconstructed Ditch. Design specifications for the reconstructed interior ditches are shown on Table V-13A, "Post-Mining Ditch Summary". All reconstructed ditches will be built to a minimum cross-sectional area of 4 ft.², and will be rip rapped with a minimum of 12" D50 rock overlying a filter blanket of 3/4" gravel. A typical section of the restored channel is shown on Figure V-3. Rip-rap design is based on the chart in Figure V-4. Once the ponds are removed, the drainage flow paths will be extended as shown on Plate 9. The retained ponds are shown "dotted" on Plate 8 to show the pond in relation to the reclaimed drainage pattern prior to and after its' removal. Ponds B and E will be eliminated during the first phase of reclamation. These are small ponds and the drainage is redirected to Ponds A, C, and D respectively, which are adequately oversized to contain the extra runoff. As shown on Table V-6A, all retained ponds have adequate capacity. Post-~~

~~mining pond sizing is shown on Tables V-2A through V-6A. For additional information including detail on removal of surface structures, please refer to this chapter, re: Reclamation.~~

~~As shown on Plate 8, berms will be employed to direct drainage during Phase I Reclamation. Berms will consist of straw bales (1 bale high) or native earth a minimum of 24" high x 36" minimum at the base x 12" minimum across the top. All berms will be removed during Phase II Reclamation, and any disturbed areas will be regraded as necessary and reseeded along with removal of the sediment ponds (See Plate 9 for final configuration).~~

~~Access roads will not be reclaimed until Phase II. At this time, roads and culverts will be removed and the areas revegetated. Straw bale berms will be placed along the downstream ends of the reclaimed roads to control sediment.~~

~~During Phase I reclamation, when Ponds B and E are removed, diversion UD-5 will also be eliminated to the permit boundary. This will be accomplished by filling in the diversion with adjacent material. Straw bales will be placed as necessary to control sediment from the reclaimed pond and diversion.~~

~~As sediment ponds are removed, any contaminated material will be hauled off to an approved disposal site. The ponds will be recontoured and drainage through the area re-established as shown on Plate 9. Longitudinal profiles of the reclaimed ponds are shown on Plates 3, 4, 5, 6, and 7. As indicated earlier, the 2-celled Permanent Impoundment will be left in place for wildlife enhancement.~~

~~Reclamation Water Monitoring~~

~~Water monitoring of the surface stations and remaining ponds will continue after reclamation, until bond release. The frequency of monitoring will be as shown on Table V-11 for "Postmining". Parameters monitored will be the same as those for operational sampling.~~

Figure V-3
Post Mining Ditch
Typical Section

~~Figure V-4~~

~~Size of Riprap to be used Downstream from Stilling Basins~~

All roads within the permit area are classified as "Primary Roads" in accordance with R614-301-527.100. Primary roads on the site are of 2 typical designs:

1. Single-lane, gravel-surfaced roads approximately 16' wide; and
2. Double-lane, either gravel or asphalt surfaced roads, approximately 26' wide.

Although all roads on site are not used for coal hauling, each road is constructed to the respective typical design and dimensions shown on Plates 17 and 17A.

Because of the variance in road types, widths and lengths, the primary roads have been designated on Plate 1 with numbers (i.e. PR-1= Primary Road 1) to facilitate the description of each:

Primary Road 1 (PR-1) - This section is a double-lane, asphalt surfaced road connecting the county road to the Wildcat Facilities. The road serves as both a main access and a coal haul road. This section of road is approximately 800' long and runs on a grade of approximately 4.875%. The finished width of the road is approximately 26', as shown on the typical section on Plate 17.

Primary Road 2 (PR-2) - This section is a single-lane, gravel surfaced road connecting the Mine Run Coal Storage Truck Loop to the previously described Primary Road 1. This road is used primarily by coal trucks bringing coal onto the site. This road section is approximately 2050' long and runs on a grade of 1.25% to a maximum of 8,000% at the top of the loop. The top width of the road is approximately 16' as shown on Plate 17A.

Primary Road 3 (PR-3) - This section of road is a double-lane, asphalt surfaced road connecting the truck scale area to the county road on the northeast end of the site. The road is used primarily for coal haulage exiting the site; however, it is also used as a secondary access to the property. The road is approximately 490' long and is on a grade of approximately 0.20%. The finished width of the road is approximately 26' as shown on Plate 17.

Primary Road 4 (PR-4) - This section is a double-lane gravel-surfaced road leading from the Beaver Creek Shop/Warehouse Road to the northern truck dump at the Wildcat Facility, and single-lane around the truck loop. This road is used primarily for coal haulage, but also provides access to the permit area north of the

railroad. The double-lane portion of the road is approximately 700' long and is on a grade averaging less than 2.10%. The single-lane portion is approximately 550' long around the truck loop, and also averages less than 4% in grade, with the maximum grade at 7.06%. The double-lane road width is approximately 26' as shown on Plate 17, and the single-lane portion is approximately 16' wide as shown on Plate 17A.

Primary Road 5 (PR-5) - This road leads from the Primary Road 2 (Mine Run Truck Loop) to the Loadout Tower. The road is used primarily for access by support equipment, this is a single-lane, gravel-surfaced road, approximately 2100' long and runs on an average grade of 2.5%. The finished road width is approximately 16' as shown on Plate 17A. *The southern end of this road will be re-routed around the eastern edge of the expanded coal storage area as part of the 2007 Modification Plan.*

Primary Road 6 (PR-6) - This road runs from the Loadout Tower area along the east edge of the railroad to the Truck Scale Area. This road is also used primarily for access by support equipment, although the northern portion is occasionally used for coal haulage. This is a single-lane, gravel-surfaced road, approximately 2150' long and runs on an average grade of 2.26%, with a maximum grade of 9.80% for less than 100'.

Primary Road 7 (PR-7) - This road leads from the northern truck dump around to the Permanent Impoundment Area and south to the Waste Coal Storage Area. This road is used primarily for support equipment access and occasionally for waste coal haulage. The road is approximately 1300' long and runs on a grade of a minimum of 0.09% on the southern area to a maximum of 2.00% between the truck dump and impoundment area. The road width is approximately 16' as shown on Plate 17A.

Primary Road 8 (PR-8) - This road leads from the northern truck dump, through the "Depression Area" and connects to Primary Road 7 near the southern end. The road is used primarily for access to the west property and "Depression Area" by support vehicles and loaders; however, coal and coal refuse are also occasionally hauled here. The road is approximately 800' long and runs on a grade from a minimum of 0% on the southern end to a maximum of 9.26% for approximately 100' near the truck loop. The road width is approximately 16', single-lane, gravel-surface as shown on Plate 17A.

Primary Road 9 (PR-9) - This road runs between Primary Road 5 and Primary Road 6, and provides access to the Coal Stockpile as well as to other facilities. The road is used primarily for access by support vehicles. The road is approximately 740' long and runs on an average grade of 2.00%. Road width is approximately 16';

single-lane, grave-surfaced as shown on Plate 17A.

Primary Road 10 (PR-10) - This road connects Primary Road 5 to Primary Road 6 near the Loadout Tower. This is a single-lane, gravel-surfaced road, approximately 380' long. The grade on this road runs from 0% to a maximum of 2.86%. The road is used primarily for support vehicle access. Road width is approximately 16' as shown on Plate 17.

Primary Road 11 (PR-11) This road will be branch off PR-7 and will extended north of the refuse pile to provide access to the new material storage area under the 2007 Modification Plan. (see Plate 1A)

Actual coal haul roads are those designated Primary Roads 1 through 4; however, since all roads are classified as primary, and since each was constructed according to a standard design as shown on Plates 17, the following information is applicable to all roads at this site.

All primary roads at this site have been designed and constructed to meet the requirements of R614-301-534.300 and R614-301-742.420, and are certified as such.

All roads are located on the most stable surface available, generally on natural ground. There are no stream fords at this site; however, ephemeral channel crossings are provided by approved, adequately sized culverts. Drainage control is provided along all roads by the use of adequately sized ditches and culverts as necessary.

All roads are constructed and maintained to minimize disturbance and adverse impacts on fish, wildlife and related environmental values. This is accomplished through the use of current, prudent engineering design practices, proper drainage control, dust control, speed control and frequent maintenance. Roads are maintained to meet applicable design standards throughout their use by blading, watering, treatment with dust control agents such as magnesium chloride, and resurfacing as necessary.

Roads are located, designed, constructed, used, maintained, and will be reclaimed so as to prevent or control damage to public or private property; they will use non-acid and non-toxic forming substances in surfacing; and they will have a static safety factor or 1.3 or greater for all embankments.

Roads will be reclaimed immediately after they are no longer required for the operations. Road reclamation will take place simultaneously with the property reclamation. ~~during Phases I and~~

II.— Roads will be reclaimed as per the plan, including: (1) Restoring natural drainage patterns; (2) Reshaping cut fill slopes to be compatible with the post-mining land use; (3) Removal of all structures (culverts, bridges, etc.); (4) Revegetation. No roads are planned to be left at this site after final reclamation.

R645-301-512.260. VARIANCE FROM APPROXIMATE ORIGINAL CONTOUR

N/A - The site will be reclaimed to approximate original contour.

**R645-301-513. COMPLIANCE WITH MSHA REGULATIONS
AND MSHA APPROVALS**

A great emphasis is put on assuring a safe mine operation and the mine and surface facilities will be operated within prudent standards to insure the health and safety of all employees. The facilities will be carefully inspected by company-trained safety engineers and state and federal mine inspectors.

The operation will abide by Utah State Coal Mine Regulations and the 1969 Federal Coal Mine Health and Safety Act. In addition, these regulations will be supplemented by a company safety policy. Various training programs will be utilized such as the following:

- Methane Measurements
- Roof and Rib Control
- Oxygen Deficiency Testing
- Ventilation
- First Aid
- Mine Rescue
- Mine Electrical Certification
- Self Rescue Training
- Use of Personal Protective Equipment
- Recognition of Electrical Hazards
- General Accident Prevention
- Mine Communications
- Job Safety Training

Many of the training programs will run continuously, such as those involving roof control and ventilation. Other programs are held annually with many oriented toward new employees.

**R645-301-513.100. COAL PROCESSING WASTE DAMS AND
EMBANKMENTS**

N/A - See R645-301-512.230

R645-301-513.200.

**IMPOUNDMENTS AND SEDIMENTATION
PONDS MEETING MSHA CRITERIA**

N/A

R645-301-513.300.

**WASTE DISPOSED IN UNDERGROUND
MINE WORKINGS**

N/A

R645-301-513.400.

REFUSE PILES

A refuse pile is permitted at the Wildcat Loadout facility for disposal of coal processing waste and sediment cleaned from sediment ponds. This pile is permitted by MSHA with I.D. number 1211-UT-09-01864-01.

The pile is constructed, maintained and inspected in accordance with MSHA regulations, 30 CFR 77.214 and CFR 77.215.

Pile design and operation are detailed in Section R645-301-512-230 and Appendix O.

R645-301-513.500.

MINE OPENINGS

N/A

R645-301-513.600.

**DISCHARGES INTO AN UNDERGROUND
MINE**

N/A

R645-301-513.700.

**SURFACE COAL MINING CLOSER THAN
500 FEET TO AN ACTIVE UNDERGROUND
MINE**

N/A

R645-301-513.800.

COAL MINE WASTE FIRES

See R645-301-512.230

R645-301-514.

INSPECTIONS

All engineering inspections, excepting those described under R645-301-514.330, will be conducted by a qualified registered professional engineer or other qualified professional specialist

under the direction of the professional engineer.

R645-301-514.100. EXCESS SPOIL

N/A - There are no excess spoil piles.

R645-301-514.200. REFUSE PILES

The refuse pile is inspected quarterly by a registered professional engineer in accordance with this section and as required by 30 CFR 77.215.2. The disposal plan is detailed in Appendix O.

R645-301-514.210. REGULAR INSPECTIONS

See R645-301-514.200 and Appendix O.

R645-301-514.220. CRITICAL CONSTRUCTION PERIODS

See R645-301-514.200 and Appendix O.

**R645-301-514.221. FOUNDATION PREPARATION AND
TOPSOIL REMOVAL**

Completed. There are no plans for additional foundation preparation or topsoil removal.

R645-301-514.222. UNDERDRAINS

N/A - There are no underdrains.

R645-301-514.223. FINAL SURFACE DRAINAGE SYSTEMS

As required by R645-301-514.210.

R645-301-514.224. FINAL GRADING AND REVEGATATION

As required by R645-301-514.210.

R645-301-514.230. CERTIFIED REPORT

A certified report is provided for Division review promptly after each inspection. The report includes appearances of instability, structural weakness and other hazardous conditions, as well as condition of surface drainage.

**R645-301-514.240. SEPARATE CERTIFICATION FOR EACH
PHASE OF CONSTRUCTION**

N/A - There are no underdrains or protective filters.

**R645-301-514.250. ON-SITE COPY OF CERTIFICATION
REPORTS**

A copy of each inspection report is maintained on-site.

R645-301-514.300. IMPOUNDMENTS

See R645-301-512.240.

R645-301-514.310. CERTIFIED INSPECTION

This is performed annually by a registered P.E.

**R645-301-514.311. COMPLETION OF CONSTRUCTION AND
YEARLY INSPECTIONS**

See R645-301-514.310.

R645-301-514.312. CERTIFIED REPORTS

Certified reports are kept on-site, and submitted with Annual Reports.

**R645-301-514.313. ON-SITE COPY OF CERTIFICATION
REPORTS**

See R645-301-514.312.

R645-301-514.320. WEEKLY INSPECTIONS

N/A

**R645-301-515. REPORTING AND EMERGENCY
PROCEDURES**

R645-301-515.100. SLIDES AND OTHER DAMAGE

The Wildcat Loadout is located on relatively flat ground, making the probability of a slide extremely remote.

If a slide should occur which may have a potential adverse effect on public, property, health, safety, or the environment, Andalex will notify the Division by the fastest available means and comply with any remedial measures required by the Division

R645-301-515.200. IMPOUNDMENT HAZARDS

Safety Precautions

The ponds were built as per specifications and under supervision of a qualified, registered professional engineer. The ponds are inspected quarterly for safety and compliance. Inspection reports are maintained on-site, and submitted to the Division on an annual basis. Ponds will be cleaned at minimum when sediment reaches 60% of designed sediment volume. Measuring devices will be installed in the ponds to show when the ponds have filled with sediment to the clean-out level.

R645-301-515.300. TEMPORARY CESSATION OF OPERATIONS

Whenever it is known that operations are to be temporarily ceased for more than 30 days, Andalex Resources will submit to the Division a notice of intention to cease or abandon the operations, in accordance with R645-301-515.320 and to MSHA standards.

This notice will describe mitigation measures to be employed in accordance with the terms and conditions of the permit approval, such as a statement of the number of surface areas involved in the cessation, prior reclamation efforts accomplished on the property, and identification of all backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

R645-301-515.310. TEMPORARY ABANDONMENT

See R645-301-515.300.

R645-301-515.311. SUPPORT AND MAINTENANCE

N/A

R645-301-515.312. SECURING SURFACE FACILITIES

Locked gates will be employed to prevent access to the site during temporary closures.

**R645-301-515.320. NOTICE OF INTENT TO CEASE OR
ABANDON OPERATIONS**

See R645-301-515.300.

**R645-301-515.321. STATEMENT OF CONDITIONS PRIOR TO
CESSATION OR ABANDONMENT,
UNDERGROUND**

See R645-301-515.300.

**R645-301-515.322. STATEMENT OF CONDITIONS PRIOR TO
CESSATION OR ABANDONMENT, SURFACE**

See R645-301-515.300.

R645-301-516. PREVENTION OF SLIDES

Andalex has agreed to interim stabilization of all slopes and embankments within the disturbed area and has done so. Andalex will notify the Division in the event of any slides or other damage.

R645-301-520. OPERATION PLAN (Also R645-301-526)

R645-301-521. GENERAL

Overview of Project

General Description

The new unit train loadout facility at Wildcat Junction is approaching the three million ton mark. To date, close to 350 unit trains have been loaded with no operating failures or significant difficulties.

The facility is designed to provide rapid train loading with an automatic sampling system meeting ASTM standards. The sampling system is a Redding Three Stage Sampler. The bulk weighing system is accurate to 0.1% and is certified by the State of Utah, Bureau of Weights and Measures every six months.

The stockpiling and reclaim system is designed to reduce handling and consequently degradation. It provides segregated stockpiles for each of the three seams which will be mined simultaneously from Andalex's Centennial Project. With segregated stockpiles, Andalex will have the capability of either a single seam shipment

or a blended seam shipment meeting any customer's requirements. The stockpile has been designed to provide adequate live storage to allow multiple unit-trains to be discharged from Wildcat successively in order to meet the demands of ship-loading and the export market.

Summary Description

Loadout Structure

5,000 tph loading rate, 300 ton surge bin, 120 ton weigh bin, programmable batch weighing system, 3 stage automatic sampler, operator control room.

Reclaim Conveyor

72" belt, 815 fpm, 1,200 hp, length = 1,035'. Four each 100' truss sections, 2 each support bents, vertical gravity take-up tower.

Reclaim Transfer Conveyor (3 each)

54" belt, 75 hp, length = 75'

Under-pile Reclaim

Nine each storage pile activators, 2,500 tph capacity each, flow control by double bladed slide gates, 30' diameter inlet cones, pile activators connected by 13' diameter multiplate tunnel. Total tunnel length = 700'.

Storage Pile

Height = 85', crest length = 468'. Three segregated piles: total storage = 106,000 t, live storage = 55,000 t. Extended (co-mingled) pile: total storage = 135,000 t, live storage = 70,000 t.

Radial Stacker

Underslung truss design, 110° arc of swing, 247' long, 36" Conv, 600 tph, 600 fpm, 100 hp drive.

Yard Conveyor From Crusher to Stacker Building (Conv Y)

36" belt. 600 tph, 450 fpm, 75 hp drive, length = 470', transfer structure at radial stacker supporting drive unit and electrical control room.

Crusher Building

600 tph impact crusher (125 hp), 2" x 0" product, 4' x 14' double deck screen, Conv T drive unit, electrical control room.

Conveyor From Truck Dump To Crusher Building (Conv T)

48" belt, 600 tph, 250 fpm, 75 hp, length = 150'. Belt scale, metal detector, tramp iron magnet.

Truck Dump

100 ton surge capacity, drive-over grizzly for end or bottom dump trucks, dozer trap opening for reclaim of run of mine storage area with a capacity of 150,000 tons.

Unit-Train Loading Track

115 lb. rail, total length = 10,133', 1 each turnout, 3 each cross overs, 1 each bumper, 2 each high stand throw switches, 3 each spring switches.

Office Building

30' x 40' containing office, small warehouse, and lab.

Scale House

14' x 60' trailer, 60' platform scales.

Shop Building

40' x 40' metal building, concrete foundation

Magnesium Chloride Storage Tank

8' x 20' metal tank, concrete stand

Electrical

Substation

2,500 KVA, 46,000 V to 4,160 V transformers, capacitors for power factor correction, designed to comply with appropriate MSHA and UP&L requirements

Yard Power

4,160 V distribution reduced to 480 V at crusher building, stacker, reclaim tunnel exit and loadout structure, transmission line = 2,600', 45' poles.

Electrical Control Rooms

Crusher Building

Motor controls, switchgear, and associated electrical controls for crusher, screen, Conv "T" drive, reclaim vent fan, scale, magnet, metal detector, water pump, and area lighting

Stacker Area (Control Room Located On Transfer Structure)

Motor controls, switchgear, and associated electrical controls for Conv "Y" drive, conveyor "S" drive, stacker propelling drive, water pump, office building, mobile equipment servicing station and area lighting

Reclaim Area (Control Room Located Near Tunnel Exit On West Side of Conv "R")

Motor controls, switchgear, and associated electrical controls for Conv "RT" drive, all storage pile activators, hydraulic power pack drives (for gate actuation), reclaim sensor scale, gate position feedback controls, methane monitors, and area lighting (including reclaim tunnel)

Loadout Area (Electrical Controls Located In Operators Control Room)

Motor controls, switchgear, and associated electrical controls for Conv "R" drive (4,160 V), batch weighing system, sampling system, car spotter, and area lighting

Electrical Class

All motors, starters, switchgear, and controls can be Class II, Div. II, even in the reclaim tunnel. However, 2 each methane monitors are to be installed in the reclaim tunnel and 1 each in the truck dump which will deactivate all electrics in the tunnel if methane is detected. Lighting in the tunnels must meet Class I, Div. I requirements.

Water

Tanks

2 ea., 10,000 gal., treated for culinary, 35 hp centrifugal

pump, enclosed tankside pump houses

Tank Location

- At crusher building to serve crusher building and truck dump
- At office building (culinary usage)

Area of Operations

Proposed Permit Area

The proposed permit area consists of part of BLM right-of-way U-48027 and is shown on Plate 1 and revised Plate 22.

Surface Area to be Disturbed

The permit area has been previously impacted by mining and loading. The entire permit area at Wildcat has been used for loading and coal storage previously. The total existing surface area disturbed is ~~60.94~~ 81.79 acres excluding the ASCA Areas and Utah Railway Tracks. Facilities are indicated on Plate 1.

Refer to Appendix S for a detailed discussion of the additional disturbance associated with the 2007 Modification Plan.

~~The disturbed area boundary has been modified to include additional area to the east of the main stockpile (radial stacker) (see Plate 22). This area has been lightly covered by wind-carried coal fines over the nine year history of Wildcat. Therefore, it is necessary to include this additional 3.7 acres as part of Andalex's disturbed area. It should be noted that this additional acreage does not constitute a significant revision (6%). Upon final reclamation this area will be cleaned of wind-carried coal fines and revegetated in a similar fashion to existing disturbed areas. Runoff from this area is currently passed through straw dikes. These dikes will be maintained on an annual basis as necessary.~~

~~Andalex has used, from time to time, a vacuuming system to pick up wind-carried coal fines at the minesite. Andalex proposes to clean as many coal fines as is practical at the Wildcat Loadout in the area east of the main stockpile. This vacuum system will be utilized in the Spring of 1994 and thereafter as necessary.~~

~~It should also be noted that due to the reoccurring situation regarding wind-carried coal fines, Andalex proposes to construct additional drift-fences near the eastern boundary of the disturbed area. Drift-fences have proven to be effective in the past at Wildcat and, therefore, additional fences will aid in~~

~~controlling wind-carried coal fines. These additional fences are depicted on the revised Plate 22.~~

Life of Project

The life of the project has been estimated at 30 years.

Schedule of Construction, Mine Development, Mining, and Reclamation

All surface facilities have been constructed for the Wildcat Loadout, *other than those described in Appendix S, "2007 Modification Plan"*. Reclamation efforts, including, but not limited to, backfilling, grading, topsoil replacement, and revegetation, of all land that is disturbed by surface operations shall occur as contemporaneously as practicable with mining operations. Upon the conclusion of loading activities, the scheduled reclamation phase will begin immediately. Please refer to Part F of this Chapter re Reclamation.

Cessation of Operations

Temporary

Andalex will inform the division if it intends to cease operations for a period of more than thirty days. This notice will include information on any activities which may continue while the facility is not in use (water monitoring, etc.).

Permanent

Upon permanent cessation of operations, Andalex will reclaim all affected areas according to its' approved MRP and return the land to its' pre-mining conditions.

Wildcat Operations

Exploration and Development Drill Sites

Shallow holes for bedrock determination were drilled for foundation studies. Please see Appendix C.

Blasting

No blasting will occur at this facility.

Water Supply

Water is trucked into the facility by a local contractor and

stored in 2 - 10,000 gallon storage tanks. One tank is used to supply culinary water to the bathhouse facilities and the other tank provides water for dust suppression for the preparation and loading operations.

There is no on-site development of surface or underground water for this facility. There are no wells.

Power Supply and Communication Facilities

Power and communications were pre-existing at this location. Andalex tapped the 46 KV powerline serving Beaver Creek Coal Company's mines and via an onsite substation, distributing 4160, 440, 220, and 110 V lines throughout the facility.

Landscaping

All disturbed areas are relatively flat, and vegetative cover has been promptly re-established to stabilize erosion.

Signs, Markers, Fences, and Gates

Signs of a uniform design, showing the company name, business address, and telephone number as well as the identification number of the current regulatory program permit authorizing the underground mining activities, have been placed at all access points to the permit area. These signs have been placed to be easily seen, are made of a durable material, and conform to local laws and regulations. The topsoil storage area is clearly marked.

As there are no perennial streams or a stream with a biological community on the permit area, buffer zone markers will not be necessary. The perimeters of all areas affected by surface operations and facilities are clearly marked. These signs and markers shall be maintained during all activities and retained and maintained until after the release of all bonds for the permit area.

Coal Handling Facilities

Please refer to this chapter, re: Description of Facilities.

Removal of Surface Structures

Upon completion of activities, all surface facilities will be removed. This includes all the facilities outlined in this chapter, re: Description of Facilities. Please refer to this chapter, re: Reclamation for the detailed plans. Also refer to this chapter, re: Reclamation Hydrology.

Operation Plan: Existing Structures

Construction and Design of Surface Facilities

Existing Structures

All existing structures are situated on Right-of-Way U-48027. Please refer to this chapter, re: Description of Facilities. Upon completion of loading activities, all buildings and structures not being utilized as part of the reclamation sequence, will be removed, according to the Reclamation Plan outlined in this chapter.

Construction

All of the above structures have been completed. Construction began in the spring of 1984 and was completed in the spring of 1985. Construction has been located and carried out so as to prevent and control erosion, siltation, water pollution, and damage to property in accordance with the regulations. All facilities have been designed and constructed and will be maintained and used in a manner which prevents damage to wildlife and related environmental values (particularly as this relates to powerline structures, regarding Fish and Wildlife). Andalex has also designed and constructed and will be maintained in a manner which prevents additional contributions of suspended solids outside the permit area. All activities shall be conducted in a manner which minimizes damage to railroads, electric and telephone lines, and water and sewage lines, which pass over or through the permit area. Andalex Resources realizes that maintenance of the facilities is a key to optimum operation. Constant upkeep of all surface facilities and structures has resulted in their maintaining excellent condition.

Construction Methods

Major Equipment

The building sites were leveled using dozers and graders. Excavations for foundations was accomplished with backhoes and scrapers. Leveling was required at all the building sites; however, cut and fill was not implemented to a large degree because the area is relatively flat lying. Topsoil was removed and transported to a nearby area for storage. Topsoil was gathered using scrapers and graders. All topsoil storage piles are located within the permit area.

All surface pads have been stabilized and all other disturbed areas (pond embankments, other slopes, etc.) have been reseeded. Where possible, a rangeland seed drill was used.

R645-301-521.100. CROSS SECTIONS AND MAPS

See R645-301-510, Volume II

R645-301-532.110. PREVIOUSLY MINED AREAS

See R645-301-510, Volume II

**R645-301-521.111. LOCATION AND EXTENT OF KNOWN
WORKINGS**

N/A

**R645-301-521.112. EXISTING OR PREVIOUSLY SURFACE
MINED AREAS**

See R645-301-510 and Volume II.

**R645-301-521.120. EXISTING SURFACE AND SUBSURFACE
FACILITIES AND FEATURES**

See R645-301-510.

**R645-301-521.121. BUILDINGS IN AND WITHIN 1000 FEET
OF THE PERMIT AREA**

There are no buildings within 1,000 feet of the permit area except those used as part of the operation. They are shown on Plates 1 and 2.

**R645-301-521.122. SURFACE AND SUBSURFACE MAN-MADE
FEATURES WITHIN THE PERMIT AREA**

There are no surface or subsurface man-made features within, passing through or passing over the permit area except the railroad, powerline, telephone cables, culverts, and etc., installed for the operation of this mine. See Plates 1 and 2 for their locations.

**R645-301-521.123. PUBLIC ROADS IN OR WITHIN 100
FEET OF THE PERMIT AREA**

The Consumers county road (Formerly State Highway 139) starts at highway 6 in Gordon Creek and bypasses the Andalex Resources'

Wildcat Loadout (Plate 1). There are 2 entrances from the County Road into the permit area, as shown on Plate 1. *There is also a public road (BLM) which runs along the east side of the property.*

**R645-301-521.124. EXISTING FACILITIES WITHIN THE
PERMIT AREAS**

There are no surface or subsurface man-made features within, passing through or passing over the permit area except the powerline, telephone cables, culverts, and etc., installed for the operation of this mine. See Plates 1 and 2 for their locations.

**R645-301-521.125. SEDIMENTATION PONDS AND
IMPOUNDMENTS**

See R645-301-512.240.

**R645-301-521.130. LANDOWNERS AND RIGHT OF ENTRY AND
PUBLIC INTEREST MAPS**

The right-of-way for which we have the legal right of entry is shown on Plate 1.

R645-301-521.131. SURFACE AND SUBSURFACE OWNERS

Owners of Record of Surface and Subsurface Contiguous Areas

All surface and subsurface areas contiguous to the permit area are owned by the United States *or State of Utah*. The name and address of the responsible authority representing the federal government is as follows:

Bureau of Land Management
Utah State Office
Federal Building
Salt Lake City, Utah 84111
(801) 524-3004

The name and address of the responsible authority representing the state government is as follows:

*Utah School and Institutional Trust Lands (SITLA)
675 East 500 South, Suite 500
Salt Lake City, Utah 84102
(801) 538-5100*

See Plate 16 for surface and sub-surface ownership.

**R645-301-521.132. RIGHT TO ENTER AND CONDUCT MINING
ACTIVITIES**

See R645-301-114.230.

**R645-301-521.133.1 OPERATIONS WITHIN 100 FEET OF
ROAD RIGHT-OF-WAY**

See R645-301-521.123.

R645-301-521.133.2 RELOCATING A PUBLIC ROAD

N/A

R645-301-521.140. MINE AND PERMIT AREA MAPS

Cross Sections, Maps, and Plans

**(Also R645-301-510 and
Volume II)**

The lands affected by this operation (surface only) are clearly shown on Plate 1. Plate 1 depicts all buildings, utilities, and facilities. All of the land within this permit area which is to be affected already has been. This is a surface facility only and involves no underground workings. The bond required by the Division is for the entire affected area including all the surface facilities.

Coal storage, topsoil storage, loading areas, coal preparation waste areas are all depicted on the surface facilities map. Additional detail on topsoil, diversions, and ponds can be found in Volume II on Plates 13, 2, and 3 through 7 respectively.

There is no storage of explosives at the Wildcat Loadout.

The final surface configurations will be similar to the surface prior to Andalex's involvement at Wildcat *as shown on Plate 9.*

Surface water monitoring locations are shown on Plate 15.

After the completion of activities at this facility, no structures will remain with the exception of the railroad grade, the tracks, and it's associated drainage structures.

All maps requiring certifications by a registered person have been done so. Included are stamps from experts in related fields such as surveying.

PLATES

PLATE #	PLATE TITLE
Plate 1	Existing Surface Facility Map
Plate 1A	Proposed Surface Facility Map
Plate 2	Drainage Map
Plate 3A	Sediment Pond C
Plate 3B	Sediment Pond E
Plate 3C	Sediment Pond F
Plate 3D	Sediment Pond G
Plate 3E	Sediment Pond H
Plate 3F	Sediment Pond I
Plate 3G	Permanent Impoundment
Plate 3H	Depression Area
Plate 4	Deleted
Plate 5	Deleted
Plate 6	Deleted
Plate 7	Deleted
Plate 8	Reclamation Hydrology
Plate 9	Final Reclamation
Plate 10	Deleted
Plate 11	Soils Map
Plate 12	Geology Map
Plate 13A	Topsoil Piles
Plate 13B	Topsoil Piles
Plate 14	Deleted
Plate 15	Watershed Map
Plate 16	Surface and Subsurface Ownership Map
Plate 17	Typical Road Cross-sections
Plate 18	Deleted
Plate 19	Deleted
Plate 20	Deleted

R645-301-521.141. AFFECTED AREA

**R645-301-521.142. UNDERGROUND WORKINGS AND
SUBSIDENCE AREAS**

N/A

R645-301-521.143. WASTE DISPOSAL SITES

See R645-301-510, Volume II.

R645-301-521.150. LAND SURFACE CONFIGURATION MAPS

See R645-301-510, Volume II.

R645-301-521.151. REQUIREMENTS

See R645-301-510, Volume II.

R645-301-521.152. PREVIOUSLY MINED AREAS

See R645-301-510, Volume II.

**R645-301-521.160. MAPS OR CROSS SECTIONS OR
PROPOSED FEATURES**

See R645-301-510, Volume II.

**R645-301-521.161. BUILDINGS, UTILITY CORRIDORS AND
FACILITIES**

See R645-301-510, Volume II.

**R645-301-521.162. AREA AFFECTED ACCORDING TO
SEQUENCE AND TIMING OF OPERATIONS**

See R645-301-510, Volume II.

R645-301-521.163. BONDED AREA

See R645-301-510, Volume II.

R645-301-521.164. COAL HANDLING FACILITIES

See R645-301-510, Volume II.

R645-301-521.165. TOPSOIL AND WASTE STORAGE AREAS

See R645-301-510, Volume II.

**R645-301-521.166. WASTE SOURCES AND DISPOSAL
FACILITIES**

See R645-301-510, Volume II.

R645-301-521.167. EXPLOSIVES STORAGE AND HANDLING

FACILITIES

N/A

R645-301-521.168. AIR POLLUTION CONTROL FACILITIES

N/A

R645-301-521.169. COAL PROCESSING WASTE FACILITIES

See R645-301-510, Volume II.

R645-301-521.170. TRANSPORTATION FACILITIES MAPS

See R645-301-510, Volume II.

R645-301-521.180. OTHER INFORMATION

See R645-301-510, Volume II.

R645-301-521.190. OTHER RELEVANT INFORMATION REQUIRED BY THE DIVISION.

At this time, there has been no other information required by the division.

R645-301-521.200. SIGNS AND MARKERS SPECIFICATIONS

Signs of a uniform design, showing the company name, business address, and telephone number as well as the identification number of the current regulatory program permit authorizing the underground mining activities, have been placed at all access points to the permit area. These signs have been placed to be easily seen, are made of a durable material, and conform to local laws and regulations. The topsoil storage area is clearly marked.

As there are no perennial streams or a stream with a biological community on the permit area, buffer zone markers will not be necessary. The perimeters of all areas affected by surface operations and facilities are clearly marked. These signs and markers shall be maintained during all activities and retained and maintained until after the release of all bonds for the permit area.

R645-301-521.210. PLACEMENT AND REMOVAL

See R645-301-521.200.

R645-301-521.220. DESIGN
See R645-301-521.200.

R645-301-521.230. MAINTENANCE
See R645-301-521.200.

**R645-301-521.240. MINE AND PERMIT IDENTIFICATION
 SIGNS**
See R645-301-521.200.

R645-301-521.241. LOCATION, UNDERGROUND MINING
See R645-301-521.200.

R645-301-521.242. LOCATION, SURFACE MINING
N/A

R645-301-521.243. INFORMATION
See R645-301-521.200.

R645-301-521.244. REQUIREMENTS
See R645-301-521.200.

R645-301-521.250. PERIMETER MARKERS
See R645-301-521.200.

**R645-301-521.251. SURFACE AFFECTED AREAS FOR
 UNDERGROUND MINING OPERATIONS**
See R645-301-521.200.

**R645-301-521.252. PERMIT AREA PERIMETER FOR SURFACE
 MINING OPERATIONS**
N/A

R645-301-521.260. BUFFER ZONE MARKERS

N/A

**R645-301-521.261. BOUNDARY MARKERS FOR SURFACE
ACTIVITIES OF UNDERGROUND
OPERATIONS**

They consist of orange "Tee" posts which are clearly visible from one marker to the next.

**R645-301-521.262. BOUNDARY MARKERS FOR SURFACE
MINING OPERATIONS**

N/A

R645-301-521.270. TOPSOIL MARKERS

See R645-301-521.200.

R645-301-522. COAL RECOVERY

N/A

R645-301-523. MINING METHOD

N/A

**R645-301-523.100. SURFACE MINING OPERATIONS WITHIN
500 FEET OF AN UNDERGROUND MINE**

N/A

**R645-301-523.200. EXCEPTIONS TO SURFACE MINING
OPERATIONS WITHIN 500 FEET OF
UNDERGROUND WORKINGS**

N/A

**R645-301-523.210. RESOURCE RECOVERY OF ELIMINATION
OF HAZARDS**

N/A

R645-301-523.220. APPROVAL BY DIVISION AND MSHA

Appendix B; Appendix O

R645-301-524. BLASTING AND EXPLOSIVES

N/A - There will be no blasting conducted at this site.

R645-301-525. SUBSIDENCE

N/A - There is no mining at this location.

R645-301-526. MINE FACILITIES

See R645-301-520 and Volume II.

R645-301-526.100. MINE STRUCTURES AND FACILITIES

See R645-301-520 and Volume II.

R645-301-526.110. EXISTING STRUCTURES

See R645-301-520 and Volume II.

R645-301-526.111. LOCATION

See R645-301-520 and Volume II.

R645-301-526.112. PLANS OR PHOTOGRAPHS

See R645-301-520.

**645-301-526.113. DATES OF CONSTRUCTION OF EXISTING
STRUCTURES**

See R645-301-520.

R645-301-526.114. MONITORING DATA

N/A

R645-301-526.115. COMPLIANCE PLAN

N/A

R645-301-526.115.1 DESIGN SPECIFICATION

See R645-301-520.

R645-301-526.115.2 CONSTRUCTION SCHEDULE

See R645-301-520.

R645-301-526.115.3 MONITORING SCHEDULES

N/A

**R645-301-526.115.4 MINIMIZING RISK OR HARM TO
ENVIRONMENT, HEALTH OR PUBLIC
SAFETY**

N/A

**R645-301-526.116. PROTECTION OF PUBLIC AND
LANDOWNERS**

See R645-301-510 and R645-301-520.

**R645-301-526.116.1 MINING OPERATIONS WITHIN 100 FEET
OF THE RIGHT-OF-WAY OF A PUBLIC
ROAD**

N/A

R645-301-526.116.2 RELOCATING A PUBLIC ROAD

N/A

**R645-301-526.200. UTILITY INSTALLATION AND SUPPORT
FACILITIES**

See R645-301-520.

R645-301-526.210. DESCRIPTION

See R645-301-520.

R645-301-526.220. COMPLIANCE REQUIREMENTS

See R645-301-520.

R645-301-526.221. PROTECTION

See R645-301-520.

**R645-301-526.222. MINIMIZATION OF ENVIRONMENTAL
IMPACT AND COMPLIANCE WITH
EFFLUENT LIMITATIONS**

See R645-301-423.200 for details, and R645-301-512.240, R645-301-512.250, R645-301-520, and R-645-301-521 for designs.

R645-301-526.300. WATER POLLUTION CONTROL FACILITIES

See R645-301-520.

R645-301-526.400. AIR POLLUTION CONTROL FACILITIES

Appendix B - Air Quality Permit.

R645-301-527. TRANSPORTATION FACILITIES

Roads

All roads within the permit area are classified as "Primary Roads" in accordance with R614-301-527.100.

See R645-301-512.250 for details.

Railroad

The rail siding roughly bisects the permit area and runs in a north-south direction. The siding is part of a Utah Railroad lease agreement with the B.L.M.

Other Transportation Facilities

Transportation facilities will be designed, constructed, or reconstructed, and maintained to prevent, to the extent possible, damage to fish, wildlife, and related environmental values; and will control to the extent possible, additional contributions outside the permit area. This has been accomplished on the railroad siding through slope stabilization, revegetation, and adequate drainage. Andalex will minimize diminution or degradation of water quality and quantity; control and minimize erosion and siltation; control and minimize pollution; and prevent damage to public or private property to the extent possible. Please note that Andalex's rail siding parallels the existing Utah Railroad mainline and is owned by the Utah Railroad.

R645-301-527.100.	ROAD CLASSIFICATION
R645-301-527.110.	DESIGNATION OF ALL ROADS
See R645-301-527.	
R645-301-527.120.	PRIMARY ROADS
See R645-301-527.	
R645-301-527.121.	USED FOR TRANSPORTING COAL OR SPOIL;
See R645-301-527	
R645-301-527.122.	FREQUENT USE OR FOR PERIODS IN EXCESS OF 6 MONTHS
See R645-301-527.	
R645-301-527.123.	RETAINED FOR POSTMINING LAND USE
See R645-301-527.	
R645-301-527.130.	ANCILLARY ROADS
See R645-301-527.	
R645-301-527.200.	TRANSPORTATION FACILITIES
See R645-301-527.	
R645-301-527.210.	DESIGNS AND SPECIFICATIONS
See R645-301-527.	
R645-301-527.220.	RELOCATION OF A NATURAL DRAINAGEWAY
N/A	
R645-301-527.230.	MAINTENANCE AND REPAIRS
N/A	
R645-301-527.240.	GEOTECHNICAL ANALYSIS
N/A	

**R645-301-527.250. ALTERNATE SPECIFICATIONS OR STEEP
CUT SLOPES**

N/A

**R645-301-528. HANDLING AND DISPOSAL OF COAL,
OVERBURDEN, EXCESS SPOIL, AND COAL
MINE WASTE**

See R645-301-512.230 and R645-301-520.

**R645-301-528.100. COAL REMOVAL, HANDLING, STORAGE,
CLEANING, AND TRANSPORTATION AREAS
AND STRUCTURES**

See R645-301-512.230.

R645-301-528.200. OVERBURDEN

N/A

**R645-301-528.300. SPOIL, COAL PROCESSING WASTE, MINE
DEVELOPMENT WASTE, AND NON-COAL
WASTE REMOVAL**

Coal Refuse

See R645-301-512.230

Acid and Toxic-Forming Materials

**(Also R645-301-711.100 and
R645-301-731.300)**

Please refer to Section R645-301-512-230, re: coal processing waste and re: leachate testing for potential acid- and toxic-forming materials. If it is determined through leach testing that the coal processing waste material is acid- or toxic-forming, then the disposal will consist of burial on the west side of Wildcat under four feet of fill material or haulage to another approved coal processing waste disposal area. Disposal will take place within 30 days after the acid or toxic forming materials are identified. The Division will be notified if the coal processing waste is to be moved off-site to another approved disposal area. If acid or toxic forming material is identified it will be buried as described above within 60 days of its discovery. There is no potential for any other acid- or toxic-forming materials within this permit area.

Non-Coal Waste

All combustibles (paper, garbage, paints, wood, etc.) are collected in trash containers and hauled to the local land fill. Non-coal wastes will be placed and stored in a controlled manner in a designated position of the permit area and will comply with R645 regulation. Please refer to Plate 1 for dumpster location.

Contingency Plans to Prevent Sustained Combustion

All which could burn would be small in quantity and consist of normal trash (cardboard, paper, etc.). The quantity would not exceed the volume of a small dumpster. The trash facility is segregated from any buildings or other structures and if ignited accidentally, could be extinguished quickly using either water or fire extinguishers. Spontaneous coal stockpile fires are generally quite small and are extinguished by frontend loaders immediately.

R645-301-528.310. EXCESS SPOIL

N/A

R645-301-528.320. COAL MINE WASTE

See R645-301-528.300.

R645-301-528.321. RETURN OF COAL PROCESSING WASTE TO ABANDONED UNDERGROUND WORKINGS

N/A

R645-301-528.322. REFUSE PILES

See R645-301-512.230 and R645-301-528.300.

R645-301-528.323. BURNING AND BURNED WASTE UTILIZATION

N/A

R645-301-528.323.1 COAL MINE WASTE FIRES

See R645-301-512.230.

R645-301-528.323.2 BURNING OR BURNED COAL MINE WASTE REMOVAL PLAN

See R645-301-512.230.

R645-301-528.330.	NON-COAL MINE WASTE
See R645-301-528.300.	
R645-301-528.331.	DESIGNATION OF NON-COAL MINE WASTE MATERIALS
See R645-301-528.300.	
R645-301-528.332.	FINAL DISPOSAL OF NON-COAL MINE WASTES
See R645-301-528.300.	
R645-301-528.333.	RESTRICTIONS ON DISPOSAL ON NON-COAL MINE WASTE MATERIAL
See R645-301-528.300.	
R645-301-528.334.	HAZARDOUS WASTE MATERIALS
See R645-301-528.300.	
R645-301-528.340.	UNDERGROUND DEVELOPMENT WASTE
N/A	
R645-301-528.350.	DISPOSAL REQUIREMENTS
N/A	
R645-301-528.400.	DAMS, EMBANKMENTS AND OTHER IMPOUNDMENTS
See R645-301-512.240.	
R645-301-529.	MANAGEMENT OF MINE OPENINGS
N/A	
R645-301-529.400.	SURFACE MINING OPERATIONS
N/A	

R645-301-530.

**OPERATIONAL DESIGN CRITERIA AND
PLANS**

All required surface structures for the Wildcat Loadout are presently in place and operating. Any additions, modifications or deletions will be submitted as amendments or revisions to this plan.

R645-301-531.

GENERAL

All structures have been properly designed, approved and constructed. Sediment ponds, dams and impoundments are detailed in Section R645-301-512.240. Roads are discussed in Section R645-301-512.250. Refuse disposal is detailed in Section R645-301-512.230 and Appendix O.

R645-301-532.

SEDIMENT CONTROL

See Appendix R

R645-301-532.100.

MINIMIZING DISTURBANCES

The permit area has been previously impacted by mining-related and processing activities. The present disturbed acreage at this site is 60.94 acres. This site represents a very compact and efficient use of space when compared to similar processing sites in the area. This is also the smallest practicable area of disturbance for the existing operations.

R645-301-532.200.

STABILIZING BACKFILLED MATERIAL

Whenever possible, areas such as embankments, topsoil piles and other non-traffic sites, area revegetated to stabilize the site and reduce runoff.

All disturbed areas will be backfilled and graded to as near as possible the approximate original contour, and to the most moderate slope possible. Slopes shall not exceed the angle of repose or such lessor slopes as required by the regulatory authority to maintain stability. Fill material will be compacted except for the last few lifts, to assure stability.

R645-301-533.

IMPOUNDMENTS

See Appendix R

R645-301-533.100.

STABILITY

See Appendix R

R645-301-533.110.

MSHA IMPOUNDMENTS

N/A

R645-301-533.200.

FOUNDATION DESIGN

Appendix C

R645-301-533.210.

STABILITY

Appendix C

R645-301-533.220.

PREPARATION

Appendix C

R645-301-533.300.

SLOPE PROTECTION

See R645-301-532.200.

R645-301-533.400.

VEGETATION OF EMBANKMENTS

See R645-301-532.200.

R645-301-533.500.

SUBMERGED HIGHWALLS

N/A

R645-301-533.600.

MSHA IMPOUNDMENTS

N/A

R645-301-533.610.

GEOTECHNICAL INVESTIGATIONS

N/A

R645-301-533.611.

CERTIFICATION

N/A

**R645-301-533.612. DESIGN AND CONSTRUCTION
 REQUIREMENTS**

N/A

R645-301-533.613. OPERATION AND MAINTENANCE

N/A

R645-301-533.614. PLANS FOR REMOVAL

N/A

R645-301-533.620. ENGINEERING DESIGN

See R645-301-512.240 and Appendix R

**R645-301-533.700. NON-MSHA IMPOUNDMENTS DESIGN
 REQUIREMENTS**

See R645-301-512.240 and Appendix R

**R645-301-533.710. DESIGN PLAN FOR NON-MSHA
 IMPOUNDMENTS**

See Appendix R

R645-301-533.711. CERTIFICATION

See Plates 3A through #H, and see Appendix R

**R645-301-533.712. DESIGN AND CONSTRUCTION
 REQUIREMENTS**

See Appendix R

R645-301-533.713. OPERATION AND MAINTENANCE

See Appendix R

R645-301-533.714. PLANS FOR REMOVAL

See Appendix R

R645-301-534. ROADS

See R645-301-512.250.

R645-301-534.100. DESIGN, USE AND RECLAMATION

See R645-301-512.250.

**R645-301-534.110. DAMAGE TO PUBLIC OR PRIVATE
PROPERTY**

See R645-301-512.250.

**R645-301-534.120. NON-ACID OR NONTOXIC FORMING
SUBSTANCES IN ROAD SURFACING**

No acid or toxic-forming substances will be used for road surfacing.

**R645-301-534.130. FACTOR OF SAFETY FOR ROAD
EMBANKMENTS**

See R645-301-512.250.

R645-301-534.140. REMOVAL AND RECLAMATION OF ROADS

See R645-301-512.250.

**R645-301-534.150. VEGETATION/STABILIZATION EXPOSED
SURFACES**

See R645-301-512.250.

**R645-301-534.200. SAFETY AND ENVIRONMENTAL
PROTECTION**

See R645-301-512.250.

R645-301-534.300. PRIMARY ROADS

See R645-301-512.250.

R645-301-534.310. LOCATION

See R645-301-512.250.

R645-301-534.320. SURFACING

See R645-301-512.250.

R645-301-534.330. MAINTENANCE

See R645-301-512.250.

R645-301-534.340. CULVERT DESIGN

See R645-301-512.240 and R645-301-512.250.

R645-301-535. SPOIL

N/A

R645-301-535.100. DISPOSAL OF EXCESS SPOIL

N/A

R645-301-535.110. MINIMUM FACTOR OF SAFETY

N/A

R645-301-535.111. LOCATION

N/A

R645-301-535.112. FOUNDATION INVESTIGATIONS

N/A

R645-301-535.113. KEYWAY CUTS OR ROCK TOE BUTTRESSES

N/A

**R645-301-535.120. EXCESS SPOIL DISPOSED OF IN
UNDERGROUND MINE WORKINGS**

N/A

R645-301-535.130. PLACEMENT OF EXCESS SPOIL

The only spoil material generated at the Wildcat Loadout is coal processing waste or refuse and sediment cleaned from the ponds. This material is placed in the refuse pile as described in Section R645-301-512.230 and Appendix O.

R645-301-535.140.

SURFACE COAL OPERATIONS

N/A

R645-301-536.

COAL MINE WASTE

See R645-301-512.230.

R645-301-536.100.

DISPOSAL FACILITY

See R645-301-512.230.

R645-301-536.110.

STABILITY

See R645-301-512.230.

R645-301-536.120.

FOUNDATION DESIGN

See R645-301-512.230.

R645-301-536.200.

PLACEMENT

See R645-301-512.230.

R645-301-536.210.

CONSTRUCTION

See R645-301-512.230.

R645-301-536.220.

PUBLIC HAZARDS

See R645-301-512.230.

R645-301-536.230.

PREVENT COMBUSTION

See R645-301-512.230.

R645-301-536.300.

**COAL MINE WASTE DISPOSED OF IN
EXCESS SPOIL FILLS**

N/A

R645-301-536.310.

REQUIREMENTS

N/A

R645-301-536.320.	NONTOXIC AND NON-ACID FORMING
N/A	
R645-301-536.330.	DESIGN STABILITY
N/A	
R645-301-536.400.	OTHER REQUIREMENTS
N/A	
R645-301-536.410.	RESTRICTIONS
N/A	
R645-301-536.420.	DESIGN PLAN
N/A	
R645-301-536.500.	DISPOSAL OF COAL MINE WASTE IN SPECIAL AREAS
See R645-301-512.230.	
R645-301-536.510.	OUTSIDE A PERMIT AREA
N/A	
R645-301-536.520.	UNDERGROUND DISPOSAL
N/A	
R645-301-536.600.	UNDERGROUND DEVELOPMENT WASTE
N/A	
R645-301-536.700.	COAL PROCESSING WASTE
See R645-301-512.230.	
R645-301-536.800.	COAL PROCESSING WASTE EMBANKMENTS
See R645-301-512.230.	

R645-301-536.810. REQUIREMENTS

See R645-301-512.230.

R645-301-536.820. MSHA REQUIREMENTS

See R645-301-512.230 and Appendix O.

R645-301-536.821. BORINGS AND TEST PITS

N/A

R645-301-536.822. FOUNDATION DESIGN

See R645-301-512.230.

R645-301-536.823. SEEP AND SPRING SURVEYS

See R645-301-512.230.

R645-301-536.824. HAZARDS

See R645-301-512.230.

R645-301-536.900. REFUSE PILES

See R645-301-512.230 and Appendix O.

R645-301-537. REGRADED SLOPES

N/A

R645-301-540. RECLAMATION PLAN

R645-301-541. GENERAL (Also R645-301-533)

NOTE: The presently approved reclamation plan for the Wildcat Loadout (as of May 17, 2007) involves two phases. Essentially the plan calls for performing nearly all the reclamation in Phase I, except for leaving in several sediment ponds until re-vegetation standards have been met, then removing the remaining ponds in Phase II, and then seeking bond release after the reclaimed pond areas have met the re-vegetation standards. This is the plan that was

originally adopted when the Mining and Reclamation Plan was initially approved in 1989. Since that time there has been an accumulated history of mine reclamation involving the numerous central Utah coal operations. Based on that intervening experience the prevailing view of reclamation is that Phase II (i.e., retaining the sediment ponds as the final stage of reclamation) is perhaps counter-productive, and that better results are usually obtained by roughening the reclaimed surface to provide post-reclamation sediment control rather than utilizing the left-over ponds. This is especially true in areas such as Wildcat which are essentially flat and erosion is generally not much of a concern, and where there are no significant drainages running through the area to be reclaimed. Therefore, as part of the 2007 Modification Plan, Andalex proposes to modify the reclamation plan by eliminating the Phase II concept. The following description of the reclamation plan is the same as the approved version in every respect other than elimination of the Phase II "retained sed pond" concept.

Reclamation will be uncomplicated since this area is flat lying and topographically simple. All disturbed areas no longer required for the conduct of operations were immediately revegetated. In the future, any areas no longer required for operations will also be immediately revegetated.

When buildings and final site preparation was completed, the topsoil was revegetated to prevent erosion.

When the project is expired, perhaps in 30 years, extraneous material will be removed. Roads will be regraded and using the most advanced technology at the time, Andalex will re-establish the terrain to as nearly the original as practical.

Reclamation Timetable

~~Reclamation will be accomplished in two phases. Phase I will commence immediately after the project has expired. Phase I involves the majority of the reclamation steps. It will bring the site to nearly complete with the exception of sedimentation ponds which will be left in place until revegetation has been determined complete. Prior to revegetation being complete, there is a possibility for runoff within the disturbed area to accumulate a sediment load. These ponds left in place will prevent this runoff from leaving the disturbed area. Once the vegetation has been established which will probably take a minimum of two years, Phase II of the reclamation will commence. This phase~~

~~involves the removal of the four sediment ponds which were left, regrading, and revegetating these areas, and finally, Andalex's commitment to monitoring.~~

~~Phase I~~

The first step will be to remove structures. Since none of the structures will remain on site, this will be the largest part of the ~~Phase I~~ effort and will also be the most expensive. The following is a list of structures which will be brought down and removed either complete or as scrap/salvage.

1. 14 x 60 Scale House Trailer
 2. Truck Scales
 3. Substation
 4. Truck Dump (west side)*
 5. Crushing Plant (west side)*
 6. Radial Stacker (west side)*
 7. Reclaim Tunnel (west side)
 8. Loadout Conveyor (west side)*
 9. Control Building (west side)
 10. Truck Dump & Reclaim (2 each)
 11. Conveyor T
 12. Crusher and Screening Plant
 13. Lump Coal Belt
 14. Stoker Radial Stacker
 15. Conveyor Y, Y-1
 16. Main Radial Stacker (2 each)
 17. Loadout Reclaim Tunnel, port supports, hoppers
 18. Conveyor R
 19. Loadout Tower
 20. Miscellaneous (Guard Rails, Office, Water Tanks, Motor Control Centers)
 21. Powerline
 22. 40' x 40' Shop Building and foundation
- * Portable

The next step will be to remove any coal remaining on the various storage areas. This will not amount to a large volume of material and it will either be hauled to an approved storage area off-site or it will be disposed of within the loadout permit area by burial. This will include the coal refuse pile currently stored at Wildcat. The refuse pile will be flattened and buried according to the reclamation plan regarding coal mine refuse.

Once the coal has been removed, then the recontouring and

regrading portion will commence. It is anticipated that the structure removal will take approximately one year to complete so at this point, we would be into the reclamation about thirteen months. The first step in the recontouring and regrading would be the removal of the culverts. They have been left in until this point so the disturbed area would drain properly. The recontouring would primarily involve the primary and secondary roads, the loadout pad, and the coal stockpile areas. The undisturbed diversion west of the facility would become permanent at this point and would be capable of passing a 100 year precipitation event. The original natural drainage could not be restored because of the Utah Railroad. This natural drainage has been either blocked or diverted for the last 30 years by predecessors to Andalex.

As part of the 2007 Modification Plan, Andalex Resources acquired aerial photography and digital mapping of the Wildcat Loadout Area. From this photography and mapping Andalex has been able to represent the site with topography on 2' contours. This mapping represents the "as-built" facility as of the spring of 2007. This topographic mapping is more accurate than the original mapping upon which the presently approved MRP is based, which now consists of hand copied ink mylars. The new digital mapping is computer-generated and utilizes X-Y-Z co-ordinates. This electronic mapping is ideal for determining comparative earthwork volumes, since new computer programs are capable of taking existing and proposed contour of the same area and accurately computing cut and fill volumes. This is more accurate than the older methods of determining volumes off of widely-spaced cross sections. Therefore, the 2007 Modification Plan amendment proposes to use this new method of computer-generated volumes for the purpose of determining earthwork volumes for final reclamation. Plate 9 is a revised reclamation map, which shows approximately 80,000 cubic yards of material will have to be moved in the process of recontouring and grading. This would replace the previous Mass Balance Summary with more current numbers reflecting the existing "as-built" site configuration versus the final reclamation configuration.

~~It is estimated by the cross sections that approximately 74,000 cubic yards of material will have to be moved in this process of recontouring and grading (please see Tables II-1 and II-1A re Mass Balance Summary). This part of Phase I will include the removal of all ponds. B and E and establishing new drainages to Ponds A, C, and D. Recontouring will take one month.~~

TABLE II-1

~~Mass Balance Summary~~

	Cut	Fill
1 + 00	740.8	926.0
0 + 00	1,111.2	
1 + 00	3,333.6	
2 + 00	1,481.6	2,963.2
3 + 00	1,852.0	5,185.6
4 + 00		5,926.4
5 + 00	1,111.2	4,074.4
6 + 00		4,444.8
7 + 00		1,481.6
8 + 00	7,037.6	4,444.8
9 + 00	6,667.2	2,963.2
10 + 00	7,037.6	2,222.4
11 + 00	4,444.8	2,963.2
12 + 00	8,519.2	4,444.8
13 + 00	1,481.6	6,296.8
14 + 00		8,148.8
15 + 00	7,408.0	4,444.8
16 + 00	6,667.2	3,704.0
17 + 00	2,222.4	5,185.6
18 + 00	5,926.4	2,222.4
19 + 00	1,481.6	1,852.0
20 + 00		740.8
21 + 00	5,185.6	
-		
Total	73,709.6	74,635.6

~~Note: Refer to Plate 14 for cross section locations.~~

TABLE II-1A

Mass Balance
Expanded Wildcat Pad Cross Sections

	Cut	Fill
0+00 - 0+60	0	0
0+80	24.0	0
1+00	22.9	0
1+20	26.1	0
1+40	24.5	0
1+60	58.7	0
1+80 - 3+80	0	0
4+00	0	78.4
4+20	0	250.4
4+40	0	302.3
4+60	181.0	301.3
4+80	157.2	310.1
5+00	139.9	273.5
5+20	132.4	272.7
5+40	135.5	271.7
5+60	153.2	251.3
5+80	169.7	204.9
6+00	171.4	194.7
6+20	173.5	148.0
6+40	185.7	109.3
6+60	227.3	88.4
6+80	234.7	35.0
7+00	211.9	17.0
7+20	0	0
Totals	2,429.6	3,109.0
x 20% swell =	485.9	
	2,915.5	

Note: Refer to Plate 14 for cross-section locations.

At the request of the Division, no extraordinary compaction will be applied to the last few lifts during the recontouring/grading, to provide a relatively loose rooting zone of four feet. This loose application of fill will eliminate the need for ripping prior to topsoil placement. During this operation, if it is determined that additional sediment control measures are needed for the diversions leading to the four ponds, they will be put in at this time. These measures might include rock check dams or straw dikes.

The next steps ~~in Phase I~~ will not take place until the fall of whatever year we are in at this point. So far the project has taken 14 to 15 months. The next two steps in the process are topsoil redistribution, where additional substitute will be hauled in if necessary, and revegetation. Once the topsoil is spread, the area will be roughened by gouging, and the area will be hydroseeded and hydromulched. The entire revegetation procedure is described in this chapter.

Finally ~~in Phase I~~, monitoring will commence. Observations of revegetation success and slope stability will be observed. If any part of this is unsuccessful, corrective measures will be taken.

Since Andalex estimates a minimum of two years before vegetation has taken hold to prevent erosion, then the entire ~~Phase I~~ project will take at least 3-1/2 years.

Phase II

~~Phase II of the reclamation will commence as soon as the monitoring of Phase I allows.~~

~~All that is left at this point is the removal (recontouring) of Ponds A, C, D, and F and the removal of the field fence surrounding the permit area. Once the areas have been graded, they will be prepared with loose filling of the upper lifts, (as described in Phase I above), prior to topsoil redistribution. At this point, if it is not already the fall season, Andalex will wait before redistributing the topsoil and revegetating. The same methods for revegetation will be used as in the Phase I reclamation.~~

Monitoring will then continue until the release of the bond.

Please note that earthwork will be done ~~in both Phase I and II~~ as much as possible during the dry seasons to avoid unnecessary erosion to the regraded areas. If dust becomes a

problem, water will be used to control it.

Reclamation Cost and Bonding

Bond information and detailed costs are provided in Appendix B.

R645-301-541.100. CESSATION OF MINING OPERATIONS

See R645-301-541.

R645-301-541.200. REMOVAL OF FACILITIES

See R645-301-541.

**R645-301-541.300. POSTMINING FACILITIES AND
MONITORING**

See R645-301-541.

**R645-301-541.400. COMPLIANCE REQUIREMENTS FOR
RECLAMATION**

See R645-301-240.

R645-301-542. NARRATIVES, MAPS AND PLANS

See R645-301-510.

R645-301-542.100. TIMETABLE

See R645-301-240 and R645-301-541.

R645-301-542.200. BACKFILLING AND GRADING PLAN

See R645-301-532.200.

R645-301-542.300. FINAL SURFACE CONFIGURATION MAPS

Plates 8 & 9.

R645-301-542.310. CERTIFICATION REQUIREMENTS

See R645-301-510 and Volume II.

R645-301-542.320.**PERMANENT FACILITIES**

The only permanent facilities to remain at the Wildcat Loadout after reclamation will be the ~~Undisturbed Diversion (UD-1)~~, Permanent Impoundment and *Depression Area* at the railroad. The ~~undisturbed diversion~~ and permanent impoundment is being left to provide drainage control for a drainage that was blocked off over 30 years ago by the railroad *creating the Depression Area*.

These structures are sized to carry runoff from a 100 year - ~~24~~ 6 hour storm, as detailed in *Appendix R*.

R645-301-542.400.**FINAL ABANDONMENT OR BOND RELEASE**Reclamation Cost and Bonding

Cost of Reclamation

Introduction

The major elements in the reclamation of Wildcat will be the dismantling and removal of the large structures. This will be accomplished primarily with manpower and some large equipment including cranes. The major structures to be removed are the loadout tower, the two loadout conveyors, the reclaim tunnel, the two radial stackers, the yard conveyor, the crushing and screening plant, and the truck dump. Also, the coal refuse pile will be flattened and covered with suitable fill material.

Andalex foresees that the removal of these structures will be done in conjunction with a salvaging project as these structures and equipment will retain a great deal of value after they are dismantled. Therefore, the cost of removing these structures may be largely absorbed by the person or persons participating in the salvage operation. However, this savings was not considered in the bond estimate.

Bond or Surety Arrangement

Andalex has procured a reclamation bond (Irrevocable Letter of Credit) in the amount of \$651,000, as established by the Division. (See Appendix B) This bond is based on detailed calculations provided by the Division. A copy of the calculations are also included in Appendix B.

Wildcat Loadout Facility

Restoration to the pre-mining land use will require:

~~PHASE I:~~

A. Removal of Structures:

1. 14 x 60 Scale House Trailer and Truck Scales
2. Substation
3. Truck Dump (west side)
4. Crushing Plant (west side)*
5. Radial Stacker (west side)*
6. Reclaim Tunnel (west side)
7. Loadout Conveyor (west side)*
8. Control Building (west side)
9. Truck Dump & Reclaim
10. Conveyor T
11. Crusher and Screening Plant
12. Lump Coal Belt
13. Stoker Radial Stacker
14. Conveyor Y
15. Main Radial Stacker
16. Loadout Reclaim Tunnel, port supports,
17. Conveyor R
18. Loadout Tower
19. Miscellaneous (Guard Rails, Office, Water and Mag. Tanks, Motor Control Centers)
20. Powerline
21. 40" x 40" Shop
- Total

* Portable

B. Cleanup Coal Piles:

1. Radial Stacker
2. Stoker, Lump
3. Mine Run and Lump
4. West Side Stoker
5. West Side Storage Pad

C. Recontouring and Regrading:

(including covering of coal refuse storage pile)

1. Culvert Removal
2. *Removal of sediment ponds*
3. Move ~~77,000~~ 80,000 yds.³

D. Compaction and Scarification:

E. Topsoil Redistribution:

F. Revegetation:

G. Monitoring Costs:
Years 1, 2, 3, 5, 9, and 10
Water
Revegetation
Erosion

~~Phase II:~~

~~A. Recontouring, Grading, Compaction, Topsoil
Redistribution, Revegetation
1. Ponds A, C, D, and F~~

~~B. Monitoring Costs:
Years 9 and 10
Revegetation
Erosion~~

Productivity will be sampled only during years 9 and 10. The reference area will be sampled during years 9 and 10.

Casing and Sealing of Drill Holes

All drill holes within the permit area have been sealed with cement from bottom to top (eight test holes referred to in Appendix C). No new holes will be drilled.

R645-301-542.500. IMPOUNDMENTS AND EMBANKMENTS

See R645-301-512.240, R645-301-541, and Appendix R

R645-301-542.600. ROADS

All roads will be removed and reclaimed per Section R645-301-541.

R645-301-542.610. CLOSURE

See R645-301-541.

R645-301-542.620. REMOVAL OF BRIDGES AND CULVERTS

See R645-301-541.

R645-301-542.630. TOPSOIL REPLACEMENT AND REVEGATATION

See R645-301-541.

R645-301-542.640.

**REMOVAL OF ROAD SURFACING
MATERIALS**

See R645-301-541

R645-301-542.700.

**FINAL ABANDONMENT OF MINE OPENINGS
AND DISPOSAL AREAS**

Plates 8 & 9.

R645-301-542.710.

DESCRIPTION

N/A

R645-301-542.720.

DISPOSAL OF EXCESS SPOIL

N/A

R645-301-542.730.

DISPOSAL OF COAL MINE WASTE

See R645-301-512.230.

R645-301-542.740.

DISPOSAL OF NON-COAL MINE WASTES

See R645-301-541.

R645-301-542.741.

PLACEMENT AND STORAGE

See R645-301-541.

R645-301-542.742.

FINAL DISPOSAL

See R645-301-541.

R645-301-542.800.

RECLAMATION COST ESTIMATE

See R645-301-240, R645-301-542.400 and Appendix B.

R645-301-550.

**RECLAMATION DESIGN CRITERIA AND
PLANS**

See R645-301-240.

R645-301-551. CASING AND SEALING OF UNDERGROUND OPENINGS

N/A

R645-301-552. PERMANENT FEATURES

See Section R645-301-542.320.

R645-301-552.100. SMALL DEPRESSIONS

See Section R645-301-542.320.

R645-301-552.200. PERMANENT IMPOUNDMENTS

See Sections R645-301-512.240, R645-301-542.320 *and Appendix R*

R645-301-553. BACKFILLING AND GRADING

See Section R645-301-541.

R645-301-553.100. DISTURBED AREAS

See Section R645-301-541.

R645-301-553.110. AOC REQUIREMENTS

See Section R645-301-541.

R645-301-553.120. HIGHWALL AND SPOILS PILE ELIMINATION

See Section R645-301-541.

R645-301-553.130. SLOPE PROTECTION AND STABILITY

See Section R645-301-541.

R645-301-553.140. EROSION AND WATER POLLUTION

See Section R645-301-541.

R645-301-553.150. SUPPORT POSTMINING LAND USE

Upon completion of Andalex Resources' mining operation, the land will continue to be used for grazing and hunting. The limited

resources, both physical and scenic, will dictate no future change in the land status. The nature of an underground mine of this size requires minimal surface disturbance. All disturbed areas shall be restored in a timely manner to conditions that are capable of supporting the uses which they were capable of supporting before any mining including high priority wildlife habitat. Andalex is not proposing an alternate post-mining land use. Andalex is not requesting an approval for an alternate post-mining land use. The anticipated post-mining land use is likely to be achieved and does not present any actual or probable hazard to public health or safety or threat of water diminution or pollution. The post-mining land use is practical and can be implemented immediately following reclamation and will not result in any violation of federal, state, or local law.

R645-301-553.200. SPOIL AND WASTE

N/A

R645-301-553.210. REQUIREMENTS FOR DISPOSAL

N/A

**R645-301-553.220. SPOIL PLACEMENT OUTSIDE MINED-OUT
AREA**

N/A

R645-301-553.221. CLEARING AND GRUBBING

N/A

R645-301-553.222. TOPSOIL REMOVAL AND STORAGE

N/A

R645-301-553.223. BACKFILLING AND GRADING

N/A

R645-301-553.230. FINAL SURFACE GRADING

See R645-301-541.

R645-301-553.240. FINAL CONFIGURATION

Plates 8 & 9.

R645-301-553.250. REFUSE PILES

See section R645-301-512.230; Plates 8 & 9.

R645-301-553.251. FINAL CONFIGURATION

See section R645-301-512.230 and Appendix O.

R645-301-553.252. COVER REQUIREMENTS

See section R645-301-512.230 and Appendix O.

**R645-301-553.260. DISPOSAL OF COAL PROCESSING WASTES
IN MINED-OUT SURFACE AREAS**

N/A

R645-301-553.300. RESTRICTIONS AND REQUIREMENTS

N/A

R645-301-553.400. CUT-AND-FILL TERRACES

N/A

R645-301-553.410. COMPATIBILITY

N/A

**R645-301-553.420. SPECIALIZED FACILITIES FOR
IMPLEMENTING POSTMINING LAND USE**

N/A

R645-301-553.500. PREVIOUSLY MINED AREAS

N/A

**R645-301-553.510. RE-MINING AREAS CONTAINING
HIGHWALLS**

N/A

R645-301-553.520. HIGHWALL ELIMINATION

N/A

R645-301-553.530. REMAINING HIGHWALLS

N/A

R645-301-553.540. SPOIL ON OUTSLOPES

N/A

R645-301-553.600. APPROXIMATE ORIGINAL CONTOUR

See R645-301-523.200.

R645-301-553.610. HIGHWALL VARIANCE REQUIREMENTS

N/A

R645-301-553.611. SPOIL AND BACKFILL

N/A

R645-301-553.612. AVAILABLE SPOIL

N/A

R645-301-553.650. HIGHWALL MANAGEMENT

See R645-301-511.100.

R645-301-553.650.100 REMAINING HIGHWALL - SIZE

N/A

R645-301-553.650.200 REMAINING HIGHWALL - APPEARANCE

N/A

R645-301-553.650.300 REMAINING HIGHWALL - MODIFICATION

N/A

R645-301-553.650.400 REMAINING HIGHWALL - LAND USE

N/A

R645-301-553.650.500 REMAINING HIGHWALL -COMPATIBILITY

N/A

**R645-301-553.700. BACKFILLING AND GRADING: THIN
OVERBURDEN**

N/A

R645-301-553.710. AVAILABLE SPOIL MATERIALS

N/A

R645-301-553.720. REQUIREMENTS

N/A

**R645-301-553.800. BACKFILLING AND GRADING: THICK
OVERBURDEN**

N/A

R645-301-553.810. FINAL GRADING

N/A

R645-301-553.820. REQUIREMENTS

N/A

R645-301-553.830. EXCESS SPOIL

N/A

R645-301-553.900. SETTLED AND REVEGETATED FILLS

N/A

R645-301-560. PERFORMANCE STANDARDS

See R645-301-510 and R645-301-541.

CHAPTER 6

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CHAPTER 6, GEOLOGY

NOTE TO REVIEWERS: The Wildcat MRP was recently re-formatted to the newer R645 regulations. This reformatted MRP was recently approved and incorporated on May 17, 2006. The current amendment is referred to as the 2007 Modification Plan and consists of three components, namely; 1) addressing Division Order DO-04 regarding wind-blown fines, 2) expanding the primary coal storage pad by about 3.5 acres, and 3) provide for a new material storage area of about 6 acres located on the west side of the facility.

Because the Wildcat MRP was recently reformatted and approved, every effort has been made in this amendment to minimize text changes, as pertains to responses to specific regulations, except where necessary to avoid inconsistencies and contradictions. Where possible, response to individual regulations regarding the proposed 2007 Modification Plan amendment have been made by referring the reviewer directly to Appendix S. This appendix contains a detailed description of the amendment and is presented in a narrative that integrates the various components which are normally addressed in the separate chapters. Within the chapters themselves, all new discussion relevant to the 2007 Modification Plan amendment is presented in italics to easily differentiate it from the previously approved and reformatted text. The submittal also utilizes the standard "redline/strike-out" to aid in the review.

R645-301-600. GEOLOGY

R645-301-610. INTRODUCTION

R645-301-611. GENERAL REQUIREMENTS

**R645-301-611.100. GEOLOGY WITHIN AND ADJACENT TO THE
PERMIT AREA**

Introduction

The Wildcat Loadout is in the Gordon Creek area of the Wasatch Plateau which is one of the major physiographic features in the region. The plateau rises from a base at approximately 6,000 feet in elevation to over 9,000 feet.

Spring Canyon and Ford Ridge (Forge Mountain) are the major

topographic features of the area. The Price River Canyon and Spring Canyon are the major area drainages.

Geologic Setting (Stratigraphy and Structure)

The permit area sits on the Masuk Member of the Mancos Shale. The Mancos Shale in this area is in excess of 5,000 feet thickness. The Mancos Shale in the area is mainly dark bluish, gray shale which becomes sandy towards the top.

The oldest unit of the Mesa Verde Group is the Star Point Sandstone. It lacks coal and consists of three sandstone tongues. The beds of sandstone range in thickness from one to ten feet in most parts. The Mesa Verde Group immediately overlies the Mancos Shale. Overlying the starpoint sandstone, is the Blackhawk formation, also of the Mesa Verde Group. The major coal seams of the entire region lie within the Blackhawk formation. The Blackhawk formation consists of cliffy sandstone beds and lagoonal sediments.

Immediately, but disconformably overlying the Blackhawk formation, is the Castlegate sandstone, also of the Mesa Verde Group. It is a single bed of massive sandstone about 450 to 500 feet thick. Above the Castlegate sandstone are 900 to 1,000 feet of sandstone, shale, and sandy shale beds, a unit called the Price River Formation which is also a member of the Mesa Verde Group.

Structure

In the Wasatch Plateau, the cliff fronts roughly parallel the strike of the beds with gentle dips to the northwest. The Mancos Shale in this area exhibits the same trends.

The Wasatch Plateau contains three complex north trending fault zones of large lateral extent. This has a tendency to disrupt mining activities on the Wasatch Plateau but will have no impact on the Wildcat Loadout Facility as this is strictly a surface facility.

History of Mining

Mining and its' related activities have been the main industry in this region for many years.

Coal was discovered in the Wasatch Plateau as early as 1874. Coal exploration eventually spread to the Book Cliffs. As early as 1889, mines started operating in the area. The Castlegate and

Sunnyside area was developed first. As the coal was usually discovered away from settled areas, the companies built houses for their employees.

There was increased production until 1920, thereafter declining during the 1920's and 1930's. However, as a result of the second World War, production bounced back to the 1920 levels and this production increase went up until 1957 when production once again declined.

Up to 75 percent of Utah's annual coal production has come from mines in the Book Cliffs.

Coal already extracted from the coal measures of the area is well over 200 million tons. Much coal remains and many mines are presently operating in the area.

Historically, coal loading activities had been the sole use for this permit area, even prior to being leased to Andalex Resources.

Geologic and Tectonic History

During the Triassic and Jurassic periods, the area of the Book Cliffs was relatively stable, but gradually subsided and received sediments. The area, assumed to have been a relatively flat lowland, was occasionally covered by a shallow sea of short geologic duration. A thick red bed sequence suggests tropical conditions. During the Triassic times, the sediments probably came from all directions but, during the Jurassic time, the major source areas were mainly to the south and west.

During the early Cretaceous, a trough developed in the Colorado Rockies and the sea invaded the area. Gradually, the sea crept westward as the trough continued to subside, reaching the east edge of the Colorado Plateau by the early part of the Upper Cretaceous.

Unconformities and thinning of various members indicate that volcanic activity to the west caused sediments to fill the basin faster than it could subside, causing the shoreline to be pushed eastward. When hills developed as a result of this activity, the incoming sediments diminished, causing the sea to move westward once more. With each pulse, the boundaries of the depositional environments moved eastward and then returned westward. This was the period the sandstone tongues of the Mesa Verde group which project into the Mancos, were deposited. This is known as the Star Point Sandstone.

Despite the fact that the sea retreated, the area continued to receive sediments under continual conditions, a condition known to have lasted well into the Eocene time. The area began to rise in full earnest during Oligocene time. Erosion attacked the previously deposited formations, and in consequence, forming the present mountain ranges and cliffs.

Geologic Hazard

Although there are faults present in the area, they will have no impact on the Wildcat Loadout Surface Facility.

Detailed Description of Strata to be Disturbed by Surface Operations

Identification of Strata

The strata disturbed by surface operations consists of a slightly sandy shale. Surface disturbance was primarily in loose sediments and coal dumps.

R645-301-611.200. PROPOSED OPERATIONS

See R645-301-551. and R645-301-529.100.

R645-301-612. CROSS SECTION, MAPS AND PLANS

See R645-301-510.

R645-301-620. ENVIRONMENTAL DESCRIPTION

See R645-301-510.

R645-301-621. GENERAL REQUIREMENTS

See R645-301-510.

R645-301-622. CROSS SECTIONS, MAPS AND PLANS

Plate 12

R645-301-622.100. TEST BORINGS AND CORE SAMPLINGS

Appendix C

R645-301-622.200. COAL SEAMS AND BURDEN

N/A

R645-301-622.300. COAL OUTCROPS

N/A

R645-301-622.400. GAS AND OIL WELLS

There are no oil or gas wells within the permit area. In 2002, a drill pad was constructed by Conoco Phillips Company for a gas well adjacent to the east permit boundary, and actually encroached on the permit as shown on Plates 1 and 2; however, to date, no drilling has been done and future drilling will not occur within the permit boundary.

R645-301-623. GEOLOGIC INFORMATION

See R645-301-611.100.

R645-301-623.100. POTENTIALLY ACID OR TOXIC FORMING STRATA

Appendix C

R645-301-623.200. RECLAMATION REQUIREMENTS

See R645-301-240.

R645-301-623.300. SUBSIDENCE CONTROL PLAN

N/A

R645-301-624. GEOLOGIC INFORMATION

See R645-301-611.100.

R645-301-624.100. DESCRIPTION

See R645-301-611.100.

R645-301-624.110. CROSS SECTIONS, MAPS AND PLANS

See R645-301-510.

R645-301-624.120. OTHER INFORMATION

Alternative Water Supply Information

The Wildcat activities will not result in any contamination, diminution, or interruption of any surface water sources within the proposed permit area. Naturally drainages have been diverted around the disturbed area. It should be noted that these are ephemeral drainages. As no springs or seeps exist on or near the permit area, there are no groundwater sources to be disrupted. Andalex has water rights on the seep in Garley Creek and upon completion of activities this water right could be transferred for another use. To date, Andalex has not developed this water. If developed, it will be used for dust suppression.

R645-301-624.130. GEOLOGIC LITERATURE AND PRACTICES

See R645-301-611.100.

R645-301-624.200. SAMPLING AND ANALYSIS

Appendix C

R645-301-624.210. LOGS

Appendix C

R645-301-624.220. CHEMICAL ANALYSES

Appendix C

R645-301-624.230. ACID OR TOXIC FORMING MATERIALS

Appendix C, R645-301-513.300.

R645-301-624.300. TEST BORINGS AND DRILL CORES

Appendix C

R645-301-624.310. LOGS

Appendix C

R645-301-624.320. ACID OR TOXIC FORMING MATERIALS

Appendix C, R645-301-513.300.

R645-301-624.330. CHEMICAL ANALYSES

Appendix C

R645-301-624.340. ROOF AND FLOOR MATERIALS

N/A

R645-301-625. ADDITIONAL INFORMATION

Appendix C

R645-301-626. WAIVER FROM COLLECTION AND ANALYSIS

N/A

R645-301-627. OVERBURDEN

N/A

R645-301-630. OPERATION PLAN

See R645-301-511.100.

**R645-301-631. CASING AND SEALING OF EXPLORATION
HOLES AND BOREHOLES**

See R645-301-551.

**R645-301-631.100. TEMPORARY CASING AND SEALING OF
DRILLED HOLES**

N/A

**R645-301-631.200. PERMANENT CASING AND SEALING OF
EXPLORATION HOLES AND BOREHOLES**

See R645-301-551.

R645-301-632.

SUBSIDENCE MONITORING

N/A

R645-301-632.100.

DEGREE OF SUBSIDENCE

N/A

R645-301-632.200.

MONITORING LOCATIONS

N/A

R645-301-640.

PERFORMANCE STANDARDS

See R645-301-551 and R645-301-529.100.

R645-301-641.

ALL EXPLORATION HOLES AND BOREHOLES

See R645-301-551 and R645-301-529.100.

R645-301-642.

MONUMENTS AND SURFACE MARKERS

N/A

CHAPTER 7

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CHAPTER 7, HYDOLOGY

NOTE TO REVIEWERS: The Wildcat MRP was recently re-formatted to the newer R645 regulations. This reformatted MRP was recently approved and incorporated on May 17, 2006. The current amendment is referred to as the 2007 Modification Plan and consists of three components, namely; 1) addressing Division Order DO-04 regarding wind-blown fines, 2) expanding the primary coal storage pad by about 3.5 acres, and 3) provide for a new material storage area of about 6 acres located on the west side of the facility.

Because the Wildcat MRP was recently reformatted and approved, every effort has been made in this amendment to minimize text changes, as pertains to responses to specific regulations, except where necessary to avoid inconsistencies and contradictions. Where possible, response to individual regulations regarding the proposed 2007 Modification Plan amendment have been made by referring the reviewer directly to Appendix S. This appendix contains a detailed description of the amendment and is presented in a narrative that integrates the various components which are normally addressed in the separate chapters. Within the chapters themselves, all new discussion relevant to the 2007 Modification Plan amendment is presented in italics to easily differentiate it from the previously approved and reformatted text. The submittal also utilizes the standard "redline/strike-out" to aid in the review.

R645-301-700. HYDROLOGY

R645-301-710. INTRODUCTION

It should be noted that the entire sedimentation and control plan, including impoundments, diversions and *reclamation hydrology* are discussed in *Appendix R, Sedimentation and Drainage Control Plan*. ~~the Engineering Chapter 5 under Section R645-301-512.240. To prevent duplication and possible omissions during amendments, references are made from this chapter to that section wherever applicable.~~

~~Section R645-301-512.240 addresses all, or relevant portions of, the following main sections in Chapter 7:~~

~~R645-301-722, 723, 724, 725, 728, 731, 732, 733, 734, 740, 741, 742, 743, 744, 752, 753, 763 and 764~~

R645-301-711. GENERAL REQUIREMENTS

See Sections R645-301-711.100 through R645-301-711.500

R645-301-711.100. EXISTING HYDROLOGIC RESOURCES

Existing Groundwater Resources

Regional Groundwater Hydrology

The groundwater resources of the Wasatch Plateau have not been studied to any great extent. The region has been characterized generally as one of regional groundwater recharge.¹ The lithologic nature of the upper cretaceous strata generally makes them unsuitable as significant aquifers. Much of the precipitation that falls in the Wasatch Plateau is removed by overland flow and evapotranspiration. The water that does enter the ground moves only short distances before discharging as springs and seeps, generally in the higher elevation areas. The regional water table is probably several hundred feet below the surface,¹ and probably coincides with the bottoms of the major streams, i.e., Price River.

The principal water bearing formations of the Wasatch Plateau are the sandstone units of the Mancos Shale Group. These include the Emery and Ferron Sandstones.¹ These sandstone units occur in the southern part of Emery County and probably do not extend into the Gordon Creek area.² The basal unit of the Mesa Verde Group, the Star Point Sandstone, is probably the principal aquifer in the Gordon Creek area; however, this unit is stratigraphically located several hundred feet in elevation higher than the loadout facility. Price and Arnow (1979) do not identify the Gordon Creek area as a region for potential large scale groundwater development.

The Mancos formation consists of approximately 5,000 feet of dark blue-gray shale with several prominent members. The loadout facility is located in the Upper or Masuk Shale Member of the Mancos. This formation is characterized as a yellow to blue-gray sandy shale and is not regarded as an aquifer (please see Figure VII-1). Little data is available on the groundwater potential of the shales in the Lower Gordon Creek Area, since they are located below the minable coal seams and above the river bottoms, and thus

¹Price and Arnow, 1974

²Fisher, 1960

have not been studied specifically. The extremely low groundwater potential of the general area, however, is supported by a field reconnaissance of the surrounding area. The drainages within a 1/2 mile radius of the loadout site are all ephemeral and no springs or seeps are known to exist within this distance, indicating a complete lack of groundwater in the shale unit in this area. The nearest water to be found in the general area is in a small seep in Garley Canyon about 1/2 mile to the southwest, and the Gordon Creek drainage located some 1-1/2 miles to the south. The flows are generally intermittent and are characterized by poor quality and a high salt content, typical of low volume flow in the Mancos Shale. Some groundwater has been measured in the Lower Mancos Shale units in Castle Valley, i.e., C.V. Spur. These areas are below the water tables of the Price River and various canals, and are likely fed by those units. An examination of available data in the MRP show groundwater quality in these areas is inconsistent and highly alkaline, commonly containing total dissolved solids in excess of 10,000 mg/l.

The spring/seep in Garley Canyon is located in the NW 1/4 NW 1/4 of Section 4, Township 13 South, Range 9 East, S.L.B.M., approximately 3/4 miles southwest of the loadout facility, as shown on Plate 15. The spring outcrops at an elevation of approximately 6,155.0 feet, in the main drainage of Garley Canyon, near the Utah Railroad Crossing. The spring is located in the Quarternary Alluvium; however, it is likely the recharge is from the alluvial terraces to the northwest, with the water surfacing near the point where the alluvium meets the more impermeable Mancos Shale below. The flow from the spring is extremely low - approximately 5 g.p.m. - and the quality is typically poor for water in this area. Andalex has filed for the water rights to this spring, and a copy of the certificate of water right is included as Appendix G. Also included in the appendix is a water sample analysis of the spring. The spring is presently used only for occasional wildlife and stock watering; however, this use is highly limited since the spring has not been developed for any specific purpose. Future use of the spring may include industrial water if Andalex decided to develop and utilize the water for its loadout operation.

Mine Plan Area Groundwater Hydrology

The processing/loadout facility is located on a low slope within the Masuk Shale Member of the Mancos Formation. Ridges adjacent to the area are capped by a loose deposit of boulders and gravels derived from the sandstones and limestones of the eroded plateaus. These gravel deposits are believed to be late tertiary or early

quaternary in age.³ Eight holes were drilled on site for a geotechnical analysis of soil foundation characteristics. Locations of the holes are shown on Figure No. 1 in Appendix C. The holes reached depths of 45', and show the top 15' to 20' to be a clayey silt and a gray shale below that depth. None of the holes intercepted any groundwater. Two additional holes were drilled up to 60' to set piling below the loadout, and no groundwater was intercepted in this drilling.

At the recommendation of the foundation consultant, Rollins, Brown, and Gunnell, the two deeper holes were left open to be monitored for groundwater infiltration. The 2-60' deep holes were left open for a period of two months and checked on a weekly basis. After two months, no groundwater had been detected in either hole and it was therefore concluded that groundwater did not exist in the area of drilling. No other data is available.

The drainages within, and adjacent to the permit area, are all ephemeral and there are no springs or seeps in this area.

There are no groundwater resources present on or adjacent to the permit area. This conclusion is based on the following:

1. Regional groundwater evaluations show minor perched aquifers in the upper (Mesa Verde Group) formations and minor groundwater occurrences in the Mancos in the valley floor below the river and canal water tables.

The permit area lies within the Masuk Shale Member of the Mancos Formation, which is in between the recorded groundwater areas. This shale member is not regarded as a regional or localized aquifer;

2. The drainages within and adjacent to the permit area are all ephemeral. The presence of groundwater would likely be shown by springs, seeps, or at least intermittent flows in some of the deeply eroded natural drainages;
3. There are no springs or seeps known to exist within or adjacent to the permit area;
4. On-site drilling reached depths of 60' and encountered absolutely no groundwater.

Effects of Operations on Groundwater

³Spieker, 1931

Regional and on-site studies, reconnaissance, and drilling indicate a complete lack of groundwater in the permit area and surrounding area. If groundwater does exist below the permit area, it is likely several hundred feet down, near the level of the valley floor. Since the operations at this site are confined to the immediate surface and since no mining extraction or subsidence will occur here, there will be no effect of the operation on groundwater.

Mitigation and Control Plans

Since there are no groundwater resources or impacts expected at this site, there will be no need for mitigation and control plans for groundwater protection. The operation will, however, be conducted in a sound and environmentally conscious manner. There will be mitigation and control plans for surface water and these plans will ensure protection of surface water which may become recharge for groundwater sources elsewhere.

Groundwater Monitoring

Since groundwater does not occur on or adjacent to the permit area, there is no baseline water quality or quantity information available, other than the drilling information on the site that confirmed no groundwater is present. As a result, no groundwater monitoring program is proposed for this operation.

Andalex Resources, Inc. will, however, perform a leachate test on the coal and reject materials stored on site as requested by the Division. Andalex will gather a special sample of the coal processing waste material for a special one time characterization. Andalex proposes to take this sample at approximately the center of the pile at a depth of approximately one foot. The sample will be a grab type sample unless the size of the specimen recovered is too large. If so, Andalex will form a composite sample from four separate locations in a radius approximately 50 feet from the center of the pile. Only one sample will be required from this depth because in an ordinary coal processing waste year, only one two foot lift is added to the reject pile. As soon as this procedure has been approved by the Division, it will be implemented. The test will consist of saturating a representative sample of material with water for a period of 24 hours and then extracting a fluid sample. The leachate will then be analyzed for the normal surface water baseline parameters. This information will then be incorporated into the probable hydrologic consequences document for the facility.

The material to be leached will also be tested for acid- or toxic-forming potential at this time. The analysis will include the following parameters: pH, Ec, SAR, Se, B, Acid-Base Potential, % Organic Carbon, Saturation Percent, and Texture. If toxic- or acid-forming materials are found to occur, a plan will be developed to ensure that drainage from these materials will not be detrimental to vegetation or adversely affect surface waters.

The above described leachate analysis was conducted in 1994 and results were submitted to the Division in the Annual Report for that year. Additional sampling of the refuse material was also conducted in 2004 and analyzed for acid and toxic properties. The results of these tests are included in Appendix D.

Surface Water Hydrology

This section will provide a review of the surface water hydrology relevant to the Andalex Wildcat Loadout Facility, as well as methods and designs to control surface waters within compliance of DOGM regulations.

Methodology

The hydrologic study is based on a review of literature and available data obtained from the USGS, NOAA Atlas, and other mine permit applications. A field reconnaissance was also conducted to confirm the location and characteristics of surface water courses. Designs of control structures are based on requirements of the regulations.

Existing Surface Water Resources

Regional Surface Water Hydrology

Most of the regional area is drained by tributaries to the Green and Colorado Rivers. Principal tributaries are the Price and San Rafael Rivers and Muddy Creek. The Green River flows through the eastern edge of the Central Utah Region.

A USGS Report entitled "Hydrologic Reconnaissance of the Wasatch Plateau - Book Cliffs Coal Field Area, Utah" considers the development of coal resources in Central Utah.⁴ The Andalex Loadout Facility lies near the coal resource areas, below the head waters of tributaries to the Price River. Much of the water from the Price River is diverted for irrigation use.

⁴Waddell and Others, 1981

Approximately 50 to 70 percent of the stream flow occurs during the May - July snowmelt runoff period.⁴ Summer precipitation does not usually produce more runoff than the snowmelt, although intense rainfall may produce high runoff in localized areas. Storms in this area are usually intense, but of relatively short duration. The 100 year -6 hour precipitation event is approximately 2.5 inches in the mountain areas, and only slightly less in the valleys (1.91 inches).

Water quality in the Price River and its' tributaries is good at the higher elevations. In most cases, surface waters at higher elevations have dissolved solid concentrations of less than 250 mg/l and are of a calcium bicarbonate type. At lower elevations, the surface water degrades to a sodium sulfate type with dissolved solids ranging from 250 to more than 6,000 mg/l.⁴ These changes are caused by irrigation return flows and natural runoff from areas underlain by Mancos Shale.

Mine Plan Area Surface Water Hydrology

There are no principal surface water courses found within 1/4 mile of the permit area, and no perennial streams within 1 mile of the permit area.

Wildcat Canyon, located approximately 3/8 mile to the north of the permit area, is an ephemeral drainage that drains a large portion of the area north of the Gordon Creek Road and leads into the Price River. No runoff from the permit area flows to Wildcat Canyon.

The North Fork of Gordon Creek is a perennial, low flow, and low quality stream, and is located approximately 1-1/4 miles to the south of the facility. No runoff from the permit area reaches this drainage.

A small ephemeral drainage known as Garley Canyon runs south of the permit area and eventually drains into the Price River approximately 3-1/2 miles southeast of the permit area. Runoff from the permit area would flow into the Garley Canyon drainage and eventually into the Price River but not before passing through a sedimentation pond.

Garley Canyon is a drainage formed in the eroding Mancos slopes below Pinyon - Juniper covered plateaus located west of the permit area. The natural drainage is highly eroded, due to the sparse vegetative groundcover and resulting rapid runoff through the weathered Mancos Shale. This is typical of drainages within the Mancos Shale in this area, and results in a high sulfate, low

quality water. Most of the water below the point where Garley Canyon meets the Price River, is diverted and used for irrigation.

The general drainage pattern of the area is shown on Plate 15.

Surface Water Quality

Surface water quality is described in Appendix J, Appendix M and in R645-301-512.240.

R645-301-711.200. POTENTIAL IMPACTS TO THE HYDROLOGIC BALANCE

See Appendix J - Probable Hydrologic Consequences and R645-301-711.100.

R645-301-711.300. COMPLIANCE WITH HYDROLOGIC DESIGN CRITERIA

Andalex will follow its approved Sedimentation and Drainage Control Plan and comply with the UPDES Permit No. UTG-040008, issued May 31, 2003 (see Appendix K). *Under the 2007 Modification Plan (see Appendix S) the UPDES discharge points associated with sediment ponds A, B and D will be transferred to new ponds G, H and I respectively. (See Plate 2)*

~~Water monitoring plans, as well as all hydrologic design details,~~ are discussed in Section R645-301-723. *All hydrologic design details are discussed in Appendix R.*

Andalex will comply with the Clean Water Act (33 U.S.C. Section 1251 et. seq.) and all other applicable water quality laws and health and safety standards.

R645-301-711.400. APPLICABLE HYDROLOGIC PERFORMANCE STANDARDS

All applicable hydrologic performance standards will be met.

R645-301-711.500. RECLAMATION ACTIVITIES

Reclamation and post-mining hydrology are discussed under Sections R645-301-512.240 and R645-301-541 *and Appendix R.*

R645-301-712. CERTIFICATION

All cross-sections, maps and plans required have been prepared and certified according to R645-301-512.

R645-301-713. INSPECTIONS

All impoundment inspections are performed according to, and described under, Section R645-301-514.300.

R645-301-720. ENVIRONMENTAL DESCRIPTION

See R645-301-711.100.

R645-301-721. GENERAL REQUIREMENTS

See R645-301-711.100.

R645-301-722. CROSS SECTIONS AND MAPS

See R645-301-510.

R645-301-722.100. LOCATION AND EXTENT OF SUBSURFACE WATER

See R645-301-711.100.

R645-301-722.200. LOCATION OF SURFACE WATER BODIES

See R645-301-711.100.

R645-301-722.300 MONITORING STATIONS

See R645-301-723 and Plates 2 and 15.

R645-301-722.400. WATER WELLS

N/A

**R645-301-722.500. EXISTING LAND SURFACE
CONFIGURATION**

Plate 1 and 2

R645-301-723. SAMPLING AND ANALYSIS

Water Monitoring Plans

Four surface water monitoring stations have been established as shown on Plate 2. Two of the stations are located in undisturbed drainage above the site and two stations will be in the same drainages below the site. This configuration will show any affects of the operation on the drainage of the area.

Since this was a new permit and no baseline data had been gathered, the stations were monitored according to the Baseline Criteria (parameters and frequency) listed in Table VII-5, "Surface Water Baseline and Operational Water Quality Parameter List", for the first two years. After that time, the stations were monitored according to the parameter and frequency requirements of the operational portion of Table VII-5. Reclamation monitoring will also follow the requirements of the Postmining portion of Table VII-6.

Water monitoring stations will be designated as WCW-1 through WCW-4 for surface monitoring points. In addition, each pond discharge will be monitored according to U.P.D.E.S. requirements. These station numbers will be designated 001 for New Pond G, 002 for New Pond H, 003 for New Pond I, 005 for Existing Pond E and 006 for Existing Pond F. Ponds A, B and D will be eliminated, and UPDES Point 005 will also be eliminated along with Pond D. The runoff formerly reporting to Pond D will now flow to new Pond I.

U.P.D.E.S. points are checked and sampled (if flowing) on a monthly basis. All other water monitoring sites are sampled on a quarterly basis.

Monitoring results will be submitted to the Division quarterly, within sixty days following the end of the reporting quarter.

Baseline monitoring will consisted of eight samples analyzed for the baseline chemical parameters on Table VII-5 (four per annum, collected quarterly during precipitation events). A rain gauge will also be installed at the site, and a log of precipitation events will be maintained on site.

It should be noted that Andalex and its designated laboratory will follow the "Standard Methods for the Examination of Water and Wastewater" for all of the above water samples.

TABLE VII-5

Surface Water Baseline and Operational
Water Quality Parameter List

Field Measurements:

- * - Water Levels or Flow
- * - pH
- * - Specific Conductivity (umhos/cm)
- * - Temperature (C°)

Laboratory Measurements: (mg/l) IONS AND METALS ANALYSES ARE
DISSOLVED, EXCEPT AS NOTED

- * - Total Settleable Solids
- * - Total Suspended Solids
- * - Total Dissolved Solids
- * - Total Hardness (as CaCO₃)
- * - Acidity
- Aluminum (Al)
- Arsenic (As)
- Barium (Ba)
- Boron (B)
- * - Carbonate (CO₃⁻²)
- * - Bicarbonate (HCO₃⁻)
- Cadmium (Cd)
- * - Calcium (Ca)
- * - Chloride (Cl⁻)
- Chromium (Cr)
- Copper (Cu)
- Fluoride (F⁻)
- * - Iron (FE) (TOTAL)
- * - Iron (Fe) (DISSOLVED)
- Lead (Pb)
- * - Magnesium (Mg)
- * - Manganese (Mn) (Total)
- * - MANGANESE (MN) (Dissolved)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Nitrogen: Ammonia (NH₃)
- Nitrate (NO₃⁻)
- Nitrite (NO₂)
- * - Potassium (K)
- Phosphate (PO₄⁻³)
- Selenium (Se)
- * - Sodium (Na)

TABLE VII-5 (Continued)

Surface Water Baseline and Operational
Water Quality Parameter List

- * - Sulfate (SO_4^{-2})
- Sulfide (S^{-})
- Zinc (Zn)
- * - Oil and Grease
- * - Cation-Anion Balance

-Baseline *Operational

TABLE VII-6

Surface Water Sampling

	Baseline	Operational	Postmining
Type of Sampling Site	Surface Water Bodies	Surface Water Bodies	Surface Water Bodies
Field Measurements (See Table 7-5)	Performed during water level/flow measurements	Performed during water level/flow measurements	Performed during water level/flow measurements
Sample Frequency	Quarterly for lakes, reservoirs, and impoundments (water level and quality); monthly flow measurements and quarterly water quality measurements (one sample at low flow and high flow each) for perennial streams. Monthly flow and water quality measurements during period of flow for intermittent streams. Sampling for ephemeral streams determined at pre-design conference.	Quarterly for lakes, reservoirs, and impoundments (water level and quality); monthly flow measurements and quarterly water quality measurements (one sample at low flow and high flow each) for perennial streams. Monthly flow and water quality measurements during period of flow for intermittent streams. Sampling for ephemeral streams determined at pre-design conference.	<u>Two</u> per annum for perennial streams (high & low flow); two per annum during snowmelt and rainfall for intermittent streams.

TABLE VII-6 (Continued)

Surface Water Sampling

	Baseline	Operational	Postmining
Sampling Duration	<u>Two</u> years (one complete year of data before submission of PAP.	<u>Yearly</u> until two years after surface reclamation activities have ceased.	Until termination of bonding.
Type of Data Collected & Reported	Flow and/or water levels and water quality.	Flow and/or water levels and water quality.	Flow and/or water levels and water quality per operational parameters.
Comments	All field measurements should be performed concurrently with water level/flow measurements.	All field measurements should be performed concurrently with water level/flow measurements.	All field measurements should be performed concurrently with water level/flow measurements.
Comments		For every fifth year preceding re-permitting, one sample at low flow and and high flow each should be taken for base-line water quality parameters.	

R645-301-724.

BASELINE INFORMATION

See R645-301-723

R645-301-724.100. GROUND WATER INFORMATION

See R645-301-711.100.

R645-301-724.200. SURFACE WATER INFORMATION

See R645-301-711.100.

R645-301-724.300. GEOLOGIC INFORMATION

See R645-301-711.100.

R645-301-724.310. PROBABLE HYDROLOGIC CONSEQUENCES

Appendix J

R645-301-724.320. RECLAIMABILITY

See R645-301-541

R645-301-724.400. CLIMATOLOGICAL INFORMATION

Introduction

The permit area, which is near part of the Wasatch Plateau Coal Field, is located in a mid-latitude steppe climate with the land below the cliffs approaching desert conditions. The nearest weather recording station is located approximately seven miles southeast of the Loadout in Price, Utah.

Temperatures at the site are 3 to 5°F cooler than at Price, seven miles southeast and 1,500 feet lower.

Average monthly temperatures at Price range from 36.9°F in January to 90° in July. Extreme temperatures of record are -31° and 108°F. Due to the elevation and a predominance of clear skies and dry air, daily temperature ranges are rather large, averaging 24° in winter and 32° in summer. Average annual precipitation is 9.31 inches at Price. The 100-year 6-hour precipitation event is 1.9 inches. (Table VII-2). Snowfall is generally light, averaging 21.1 inches annually, at Price. Potential evaporation is about 36 inches per year. The area is almost completely surrounded by mountains which act as a barrier to storms approaching from every direction except south.

Source of Data

National Oceanic and Atmospheric Administration, National Climatic Center, Asheville, North Carolina.

Western Regional Climate Center, Reno, Nevada.

Climatological Factors

Precipitation

The precipitation in the area, which is largely controlled by elevation, varies from 0.50 inches per month to 1.22 inches per month, with an annual average of 9.31 inches.

The principal rainfall is in late summer/early fall when the area is occasionally subjected to thunderstorm activity associated with moisture-laden air masses moving in from the Gulf of Mexico.

Snowfall is generally light, averaging less than 22 inches annually.

The Monthly Climate Summary for the Period of Record (9/1/1968 - 6/30/2004) is shown below on Table VII-1.

TABLE VII-1

PRICE WAREHOUSES, UTAH (427026)

Period of Monthly Climate Summary

Period of Record: 9/1/1968 to 6/30/2004

	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	36.9	42.8	52.5	63.2	72.5	83.8	90.0	88.4	79.5	64.8	49.5	40.1	63.7
Average Min. Temperature (F)	13.4	19.7	27.6	34.6	42.9	52.1	58.3	57.0	48.1	37.5	25.7	16.7	36.1
Average Total Precipitation (in.)	0.76	0.73	0.73	0.50	0.66	0.57	0.89	1.04	1.10	1.22	0.59	0.51	9.31
Average Total Snowfall (in.)	8.0	4.1	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	2.2	5.3	21.1
Average Snow Depth (in.)	3	2	0	0	0	0	0	0	0	0	0	1	1

Percent of possible observations for period of record.

Max. Temp.: 77.6% Min. Temp.: 77.7% Precipitation: 94.5% Snowfall: 93.1% Snow Depth: 88.3%

Check Station Metadata or Metadata graphics for more detail about data completeness.Western Regional Climate Center, wrcc@drcl.edu

TABLE VII-2

ESTIMATED RETURN PERIODS FOR SHORT DURATION PRECIPITATION
(inches)

Station: Price
Latitude: 39° 37'

Elevation: 5680
Longitude: 110° 50'

D U R A T I O N

Years	5	10	15	30	1	2	3	6	12	24
	Min	Min	Min	Min	Hr	Hr	Hr	Hr	Hr	Hr
1	.08	.13	.17	.23	.29	.37	.44	.62	.78	.95
2	.12	.18	.23	.32	.40	.49	.58	.80	1.00	1.20
5	.16	.25	.32	.44	.56	.68	.79	1.07	1.32	1.58
10	.20	.31	.39	.54	.68	.81	.94	1.25	1.53	1.82
25	.24	.37	.47	.65	.82	.98	1.13	1.50	1.83	2.18
50	.28	.43	.54	.75	.95	1.12	1.29	1.71	2.08	2.47
100	.31	.49	.62	.85	1.08	1.27	1.45	1.91	2.32	2.74

Table VII-3 shows the average monthly precipitation for the period 1936-1976.

The climatology summary by month for period 1936-1965 is given in Table VII-4.

Temperature

The average annual maximum temperature for the period 1968 - 2004 was 63.7 degrees. The annual mean temperature was 49.9 degrees and the annual minimum temperature was 36.1 degrees. See Table VII-1.

Summers are characterized by hot days and cool nights. However, the high temperatures are not oppressive since the relative humidity is low. The hottest month is July with the maximum temperature on most days nears 90 degrees and the lows in the upper 50's.

The winters are cold and uncomfortable, but usually not severe, due in part to the protecting influence of the mountain ranges to the north and east which prevent cold arctic air masses from moving into the area.

Temperatures of 100 degrees or higher during summer or 15 degrees below zero or colder during winter are likely to occur once every three years.

The freeze-free period, or growing season, averages about five months in length, from early May to early October.

Average Temperature values are given on Table VII-1.

Wind

The prevailing wind direction for the Price-Carbon County area for the period 1992-2002 is from the North for all months of the year. (Table VII-3) The average wind speed for this same period is shown to be 6.2 mph, with the lowest average speed of 4.7 mph in December, and the highest average speed of 7.7 mph in April, (Table VII-4).

TABLE VII-3

UTAH
Prevailing Wind Directions

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
BRYCE CANYON AP, UT (KBCE).	W	W	W	W	W	W	W	W	W	W	W	W	W
CANYONLANDS AP-MOAB, UT	NW	W	W	W	W	SW	SE	E	W	W	W	NW	W
CEDAR CITY AP, UT (KCDC).	SSW	SW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SW	N	SSW	SSW
LOGAN AIRPORT, UT (KLGU).	N	N	N	N	N	N	N	S	N	N	N	N	N
MILFORD AIRPORT, UT (KMLF).	S	SSW	S	SSW	S	SSW	SSW	S	S	S	S	S	S
OGDEN AIRPORT, UT (KOGD).	SSE	S	SSE	S	S	S	S	S	S	S	S	S	S
OGDEN-HILL AFB, UT (KHIF).	E	E	E	E	E	E	E	E	E	E	E	E	E
PRICE-CARBON COUNTY AP, UT	N	N	N	N	N	N	N	N	N	N	N	N	N
PROVO MUNI AP, UT (KPVU).	NW	NW	NW	NW	NW	NW	SE	SE	SE	SE	SSE	SSE	NW
SALT LAKE CITY AP, UT (KSLC)	S	S	SSE	SSE	SSE	S	SSE	SSE	SSE	SE	SE	S	SSE
ST. GEORGE MUNI AP, UT (KSGU)	E	ENE	ENE	W	W	W	W	ENE	ENE	ENE	E	E	ENE
VERNAL AIRPORT, UT (KVEL).	W	W	WNW	W	W	W	W	W	W	W	WNW	W	W
WENDOVER AP, UT (KENV).	NW	NW	E	NW	E	E	E	E	E	E	E	E	E

Prevailing wind direction is based on the hourly data from 1992-2002 and is defined as the direction with the highest percent of frequency. Many of these locations have very close secondary maximum which can lead to noticeable differences month to month.
[Http://www/wrcc/dri/edu/htmlfiles/westwinddir.html](http://www/wrcc/dri/edu/htmlfiles/westwinddir.html)

TABLE VII-4

UTAH

Prevailing Wind Speed (mph)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
BRYCE CANYON AP, UT (KBCE).	8.4	8.9	9.1	10.6	10.0	10.1	8.5	8.5	8.7	8.4	8.2	6.9	8.8
CANYONLANDS AP-MOAB, UT	4.0	5.3	6.9	9.1	9.2	8.5	7.4	6.9	6.3	5.2	4.0	3.5	6.2
CEDAR CITY AP, UT (KCDC).	7.2	7.6	8.4	9.1	9.4	9.3	8.5	8.2	7.5	6.7	6.5	6.6	7.9
LOGAN AIRPORT, UT (KLGU).	3.2	3.8	4.9	6.1	5.8	5.7	5.9	5.2	4.3	4.1	3.4	3.0	4.5
MILFORD AIRPORT, UT (KMLF).	10.5	10.4	10.8	11.6	11.6	12.3	11.9	11.0	9.9	10.0	9.5	9.9	10.7
OGDEN AIRPORT, UT (KOGD).	5.3	6.2	7.3	8.0	7.6	7.7	7.2	7.4	6.7	6.4	5.9	5.8	6.8
OGDEN-HILL AFB, UT (KHIF).	8.7	9.5	9.8	9.7	9.1	9.5	9.8	9.7	9.3	9.0	8.9	9.1	9.3
PRICE-CARBON COUNTY AP, UT	5.0	5.1	7.1	7.7	7.5	7.4	6.5	6.1	6.2	6.1	5.4	4.7	6.2
PROVO MUNI AP, UT (KPVU).	4.8	5.7	7.2	7.9	7.2	7.6	6.7	6.7	6.3	5.8	5.4	5.2	6.4
SALT LAKE CITY AP, UT (KSLC)	7.0	7.5	8.7	9.3	9.1	9.5	9.6	9.9	8.9	8.0	7.7	7.5	8.6
ST. GEORGE MUNI AP, UT (KSGU)	3.5	4.5	5.7	7.5	8.3	8.5	7.9	7.3	6.0	4.4	3.4	3.1	5.8
VERNAL AIRPORT, UT (KVEL).	3.2	4.0	5.9	7.3	7.5	7.0	5.8	5.6	5.3	4.9	4.0	3.0	5.3
WENDOVER AP, UT (KENV).	1.8	5.5	7.2	8.9	8.8	8.7	8.1	7.4	6.4	5.9	5.0	4.7	6.8

The above monthly average wind speeds are based on hourly observations from all reporting airports in the Western United States and based on data from 1992-2002. Some stations have at least 2 years of hourly data used for the averages. Averages for first order stations may differ from data seen in the ICD's due to a different period of record used and a possible change in the height of the wind instruments. The standard anemometer height for all current stations is 10 meters.

[Http://www/wrcc/dri/edu/htmlfiles/westwinddir.html](http://www/wrcc/dri/edu/htmlfiles/westwinddir.html)

R645-301-724.410. CLIMATOLOGICAL FACTORS

See R645-301-724.400.

R645-301-724.411. AVERAGE SEASONAL PRECIPITATION

See R645-301-724.400.

R645-301-724.412. PREVAILING WINDS

See R645-301-724.400.

R645-301-724.413. SEASONAL TEMPERATURE RANGES

See R645-301-724.400.

R645-301-724.420. OTHER INFORMATION

N/A

R645-301-724.500. SUPPLEMENTAL INFORMATION

N/A

R645-301-724.700. STREAMS

See R645-301-711.100.

**R645-301-725. BASELINE CUMULATIVE IMPACT AREA
INFORMATION**

See R645-301-711.100 and Appendix J.

**R645-301-725.100. INFORMATION FROM FEDERAL OR STATE
AGENCIES**

See R645-301-711.100 and Appendix J.

R645-301-725.200. INFORMATION FROM APPLICANT

See R645-301-711.100 and Appendix J.

R645-301-725.300. RESTRICTIONS ON PERMIT

N/A

R645-301-726. MODELING

N/A

**R645-301-727. ALTERNATIVE WATER SOURCE
INFORMATION**

The permit area and adjacent areas contain no renewable ground water or surface water resources; therefore water right protection or mitigation measures are not anticipated to be required at this operation. Also, this is a surface operation, with no underground mining or subsidence potential. All water used on site is hauled in.

**R645-301-728. PROBABLE HYDROLOGIC CONSEQUENCES
 (PHC) DETERMINATION**

Appendix J

R645-301-728.100. DETERMINATION OF PHC

Appendix J

R645-301-728.200. BASIS OF DETERMINATION

Appendix J

R645-301-728.300. PHC DETERMINATION FINDINGS

Appendix J

**R645-301-728.310. ADVERSE IMPACTS TO HYDROLOGIC
BALANCE**

Appendix J

**R645-301-728.320. ACID FORMING OR TOXIC FORMING
MATERIALS**

Appendix J

R645-301-728.330.

IMPACT OF OPERATIONS

See Appendix J.

R645-301-728.331.

SEDIMENT YIELD FROM DISTURBED AREA

See Appendix R.

R645-301-728.332.

WATER QUALITY PARAMETERS

R645-301-723

R645-301-728.333.

FLOODING OR STREAM-FLOW ALTERATION

N/A

R645-301-728.334.

**GROUND WATER AND SURFACE WATER
AVAILABILITY**

See R645-301-711.100 and Appendix J.

R645-301-728.335.

OTHER CHARACTERISTICS

Appendix J

R645-301-728.340.

IMPACT ON SURFACE OR GROUND WATER

Appendix J

R645-301-728.350.

IMPACT ON STATE-APPROPRIATE WATER

Appendix J

R645-301-728.400.

PERMIT REVISIONS

Appendix J

R645-301-729.

**CUMULATIVE HYDROLOGIC IMPACT
ASSESSMENT (CHIA)**

(BY DIVISION)

R645-301-729.100.

DIVISION ASSESSMENT

(BY DIVISION)

R645-301-729.200. PERMIT REVISIONS

N/A

R645-301-730. OPERATION PLAN

See R645-301-511.100.

R645-301-731. GENERAL REQUIREMENTS

See R645-301-511.100.

R645-301-731.100. HYDROLOGIC BALANCE PROTECTION

See R645-301-711-300.

R645-301-731.110. GROUND WATER PROTECTION

Appendix J and R645-301-711.100.

R645-301-731.111. GROUND WATER QUALITY

Appendix J and R645-301-711.100.

R645-301-731.112. SURFACE MINING OPERATIONS

N/A

R645-301-731.120. SURFACE WATER PROTECTIONS

Appendix J and R645-301-711.100.

R645-301-731.121. SURFACE WATER QUALITY

Appendix J, Appendix M and R645-301-711.100.

R645-301-731.122. SURFACE WATER QUANTITY PLAN

Appendix J and R645-301-711.100.

R645-301-731.200. WATER MONITORING

See R645-301-723.

R645-301-731.210. GROUND WATER MONITORING

There is no ground water monitoring at this site. See R645-301-711.100.

R645-301-731.211. GROUND WATER MONITORING PLAN

There is no ground water monitoring at this site. See R645-301-711.100.

R645-301-731.212. SAMPLING AND REPORTING DATA

See R645-301-723.

R645-301-731.213. NON-ESSENTIAL AQUIFERS

N/A

R645-301-731.214. DURATION

See R645-301-723.

R645-301-731.214.1 SUITABILITY

See R645-301-723.

R645-301-731.214.2 COMPLIANCE

See R645-301-723.

**R645-301-731.215. EQUIPMENT, STRUCTURES AND OTHER
DEVICES USED IN CONJUNCTION WITH
MONITORING**

See R645-301-723.

R645-301-731.220. SURFACE WATER MONITORING

See R645-301-723.

R645-301-731.221. SURFACE WATER MONITORING PLAN

See R645-301-723.

R645-301-731.222 DESCRIPTION

See R645-301-723.

R645-301-731.222.1 PARAMETERS

See R645-301-723.

R645-301-731.222.2 POINT SOURCE DISCHARGES

See R645-301-723 and Appendix K.

R645-301-731.223. SAMPLING AND REPORTING DATA

See R645-301-723.

R645-301-731.224. DURATION

See R645-301-723.

R645-301-731.224.1 SUITABILITY

See R645-301-723.

R645-301-731.224.2 COMPLIANCE

See R645-301-723.

**R645-301-731.225. EQUIPMENT, STRUCTURES AND OTHER
DEVICES USED IN CONJUNCTION WITH
MONITORING**

See R645-301-723.

R645-301-731.300. ACID AND TOXIC FORMING MATERIALS

See R645-301-711.100, R645-301-528.300 and Appendix J.

**R645-301-731.310. DRAINAGE INTO SURFACE AND GROUND
WATER**

See R645-301-711.100 and Appendix J.

R645-301-731.311.

**MATERIAL ADVERSELY AFFECTING WATER
QUALITY**

See R645-301-512.240

R645-301-731.312.

STORING MATERIALS

See R645-301-512.240

R645-301-731.320.

DISPOSAL PROVISIONS

See R645-301-512.240

R645-301-731.400.

TRANSFER OF WELLS

No transfer of wells has taken place, nor is any transfer anticipated.

R645-301-731.500.

DISCHARGES

See *R645-301-723 and Appendix R.*

R645-301-731.510.

**DISCHARGES INTO AN UNDERGROUND
MINE**

N/A

R645-301-731.511.

DEMONSTRATION

N/A

R645-301-731.511.1

PREVENTION OF DAMAGE

N/A

R645-301-731.511.2

**VIOLATION OF WATER QUALITY
STANDARDS OR EFFLUENT LIMITATIONS**

N/A

R645-301-731.511.3

COMPLIANCE REQUIREMENTS

N/A

R645-301-731.511.4 MEET WITH THE APPROVAL OF MSHA

N/A

R645-301-731.512. DISCHARGE LIMITATIONS

N/A

R645-301-731.512.1 WATER

N/A

R645-301-731.512.2 COAL PROCESSING WASTE

N/A

R645-301-731.512.3 FLY ASH

N/A

**R645-301-731.512.4 SLUDGE FROM ACID MINE DRAINAGE
TREATMENT**

N/A

R645-301-731.512.5 FLUE-GAS DESULFURIZATION SLUDGE

N/A

**R645-301-731.512.6 INERT MATERIALS USED FOR
STABILIZING UNDERGROUND MINES**

N/A

R645-301-731.512.7 UNDERGROUND MINE DEVELOPMENT WASTE

N/A

**R645-301-731.513. DIVERTING MINE WATER INTO
UNDERGROUND WORKINGS**

N/A

R645-301-731.520. GRAVITY DISCHARGES FROM MINE WORKINGS

N/A

R645-301-731.521. DISCHARGE CONTROL

See Appendix R.

R645-301-731.522. PREVENTION OF DISCHARGE

N/A

R645-301-731.530. REPLACEMENT OF STATE-APPROPRIATED WATER SUPPLY

N/A

R645-301-731.600. STREAM BUFFER ZONES

N/A

R645-301-731.610. BUFFER ZONE LOCATIONS

N/A

R645-301-731.611. VIOLATION OF WATER QUALITY STANDARDS OR EFFLUENT LIMITATIONS

Coal processing and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water quality standards and will not adversely affect the water quantity and quality of other environmental resources of the stream.

R645-301-731.612. STREAM DIVERSIONS

See Appendix R, Culvert Design

R645-301-731.620. BUFFER ZONE SIGNS AND MARKERS

N/A

R645-301-731.700. CROSS SECTIONS AND MAPS

Plate 2.

R645-301-731.710. WATER SUPPLY INTAKES

N/A

**R645-301-731.720. WATER HANDLING AND STORAGE
FACILITIES**

Water is trucked from Price for culinary use and is stored in one 12,000-gallon tank on the property.

R645-301-731.730. MONITORING LOCATIONS

See 2 and Plate 15.

R645-301-731.740. MAPS

See Volume II, R645-301-510.

R645-301-731.750. CROSS SECTIONS

See Volume II, R645-301-510.

R645-301-731.760. OTHER RELEVANT DRAWINGS

See Appendix R.

R645-301-731.800. WATER RIGHTS AND REPLACEMENT

Appendix G

R645-301-732. SEDIMENT CONTROL MEASURES

See Appendix R.

R645-301-732.100. SILTATION STRUCTURES

See Appendix R.

R645-301-732.200. SEDIMENTATION PONDS

See Appendix R.

R645-301-732.210. COMPLIANCE REQUIREMENTS

See Appendix R.

R645-301-732.220. MSHA REQUIREMENTS

N/A

R645-301-732.300. DIVERSIONS

See Appendix R.

R645-301-732.400. ROAD DRAINAGE

See Appendix R, Plate 2, also R645-301-512.250.

**R645-301-732.410. ALTERATION OR RELOCATION OF A
NATURAL DRAINAGEWAY**

See Appendix R.

R645-301-732.420. INLET PROTECTIONS

See Appendix R.

R645-301-733. IMPOUNDMENTS

See Appendix R.

R645-301-733.100. GENERAL PLANS

See Appendix R.

R645-301-733.110. CERTIFICATION

See Appendix R and Appendix H, also Plates 3A thru 3H

R645-301-733.120. MAPS AND CROSS SECTIONS

See Plates 3A thru 3H., also R645-301-510.

R645-301-733.130. NARRATIVE

See Appendix R.

R645-301-733.140. SURVEY RESULTS

Appendix J

R645-301-733.150. HYDROLOGIC IMPACT

Appendix J

R645-301-733.160. DESIGN PLANS AND CONSTRUCTION SCHEDULE

See Appendix R.

R645-301-733.200. PERMANENT AND TEMPORARY IMPOUNDMENTS

Permanent Impoundment - The permanent impoundment shown on Plate 2 is a 2-celled structure that catches most of the main canyon drainage from the west. The upper cell is a vegetated basin constructed by a previous owner. Upon surveying the upper cell, it was determined to be inadequate to contain runoff from a 100 year - 6 hour event for the area; therefore, a second, lower cell was constructed in the fall of 1991. The structures were resurveyed after completion, and now have adequate capacity (1.114 acre feet) to fully contain the runoff from a 100 year - 6 hour event (1.031 acre feet).

The upper cell is fitted with two 18" cmp overflows, one for primary overflow and one for emergency overflow. These culverts pass beneath the road between the cells and discharge into the lower cell via erosion - protected channels. The lower cell is equipped with an adequately sized open-notch overflow, protected by rip-rap. This overflow is for emergency purposes only, and will be used only for discharge of runoff beyond the design event (100 year - 6 hour). Details of the "As-Constructed" Permanent Impoundment are shown on Plate 3G. Volume calculations and requirements are summarized in Appendix R.

Upon final reclamation of the area, the two 18" cmp culverts between cells will be replaced by an open-notch overflow of the same size and design of that existing in the lower cell. The area will be reseeded according to the approved methodology and specifications in the MRP. The 2-celled pond will then be left in place as a permanent feature and allowed to go through natural succession. The upper cell of the impoundment has been in place since approximately 1971, and has never overflowed or breached

since that time. The lower cell will simply add to that level of protection. Leaving the impoundment in place will provide for wildlife enhancement as well as runoff protection, through the establishment of a permanent waterhole to capture runoff.

Depression Area:

This area is located below the 2-celled Permanent Impoundment, between the Permanent Impoundment and the railroad tracks. The area receives a very small amount of water from direct precipitation, and would otherwise receive larger amounts of water only through overflow or failure of the Permanent Impoundment. Calculations show the Depression Area to have a capacity of 4.99 acre feet at an elevation 2' below the tracks - this is 616% of the capacity of the Permanent Impoundment requirements for a 100 year - 6 hour storm event. The Depression Area, however, does not have an overflow; therefore, the following monitoring and de-watering plan is proposed in the unlikely event of significant water accumulation:

- (1) Monitoring - A steel post will be set at the low point of the depression area. This post will be marked at an elevation of 2' above ground level. This elevation will mark the point at which the area will be dewatered.
- (2) Dewatering - If water should accumulate to the mark on the monitoring post, the area will be dewatered using the pump system approved for decanting the sediment ponds on the property.

Due to the size and location of this area along the Utah Railway Right-of-Way, there are no plans to remove or otherwise alter this area upon final reclamation. The justifications for leaving it in place would be the same as those for the Permanent Impoundment, since that would be the primary source of water.

The permanent impoundment will meet the requirements of R645-301-552.200 to allow authorization by the Division, based on the following:

1. The quality of the water will be suitable for wildlife watering, since it will contain only natural runoff;
2. The level of water will vary directly with runoff events, evaporation, and usage;
3. The impoundment will be in an area of controlled public

access; however, the area will not be restricted to wildlife use;

4. No diminution of water quality or quantity is expected from this impoundment - it will be strictly runoff water, which has been captured in this impoundment for many years prior to the filing of this permit;
5. The impoundment does not meet the criteria or size of MSHA 30 CFR 77.216 (a);
6. The size of the impoundment is adequate for wildlife watering;
7. The impoundment has been, and will continue to be, suitable for the post-mining land use, which is wildlife watering;
8. Perimeter slopes are stable and do not exceed 2v:1h. Slopes are vegetated, as is the inlet area for erosion protection;
9. The impoundment is mostly incised, and does not have outlet structures; however, no discharge is expected since the pond is well oversized for a 100 year - 6 hour event (See Table V-7A).
10. The impoundment shall be maintained as necessary during the mining operation;
11. The impoundment design and construction is certified by a registered, professional engineer.

R645-301-733.210. REQUIREMENTS

See R645-301-733.200.

**R645-301-733.220. DEMONSTRATION FOR PERMANENT
IMPOUNDMENTS**

See R645-301-733.200.

R645-301-733.221. ADEQUACY FOR INTENDED USE

See R645-301-733.200.

**R645-301-733.222. WATER QUALITY AND EFFLUENT
LIMITATIONS**

See R645-301-733.200.

R645-301-733.223. WATER LEVEL

See R645-301-733.200.

R645-301-733.224. FINAL GRADING

See R645-301-733.200.

**R645-301-733.225. DIMINUTION OF QUALITY AND QUANTITY
OF WATER UTILIZED BY OTHERS**

See R645-301-733.200.

**R645-301-733.226. SUITABILITY FOR POSTMINING LAND
USE**

See R645-301-733.200.

R645-301-733.230. TEMPORARY IMPOUNDMENTS

See R645-301-733.200.

R645-301-733.240. HAZARD NOTIFICATIONS

See R645-301-733.200.

R645-301-734. DISCHARGE STRUCTURES

See R645-301-733.200.

R645-301-735. DISPOSAL OF EXCESS SPOIL

See R645-301-512.230.

R645-301-736. COAL MINE WASTE

See R645-301-512.230.

R645-301-737.

NON-COAL MINE WASTE

See R645-301-512.230.

R645-301-738.

**TEMPORARY CASING AND SEALING OF
WELLS**

N/A

R645-301-740.

DESIGN CRITERIA AND PLANS

See Appendix R.

R645-301-741.

GENERAL REQUIREMENTS

See Appendix R.

R645-301-742.

SEDIMENT CONTROL MEASURES

See Appendix R.

R645-301-742.100.

GENERAL REQUIREMENTS

See Appendix R.

R645-301-742.110.

DESIGN

See Appendix R.

R645-301-742.111.

PREVENTION

See Appendix R.

R645-301-742.112.

EFFLUENT LIMITATIONS

Appendix K

R645-301-742.113.

EROSION PROTECTION

See Appendix R.

R645-301-742.120.

MEASURES AND METHODS

See Appendix R.

**R645-301-742.121. RETAINING SEDIMENT WITHIN
DISTURBED AREAS**

See Appendix R.

**R645-301-742.122. DIVERTING RUNOFF AWAY FROM
DISTURBED AREAS**

See Appendix R.

**R645-301-742.123. DIVERTING RUNOFF USING PROTECTED
CHANNELS**

See Appendix R.

**R645-301-724.124. PHYSICAL TREATMENT TO REDUCE FLOW
OR TRAP SEDIMENT**

See Appendix R.

R645-301-742.125. CHEMICAL TREATMENT

N/A

R645-301-742.126. IN-MINE TREATMENT

N/A

R645-301-742.200. SILTATION STRUCTURES

See Appendix R.

R645-301-742.210. GENERAL REQUIREMENTS

See Appendix R.

R645-301-742.211. DESIGN

See Appendix R.

R645-301-742.212. REQUIREMENTS

See Appendix R.

**R645-301-742.213. SILTATION STRUCTURES WHICH IMPOUND
WATER**

See Appendix R.

R645-301-742.214. POINT SOURCE DISCHARGES

See R645-301-723 and Appendix K.

R645-301-742.220. SEDIMENTATION PONDS

See Appendix R.

R645-301-742.221. USE

See Appendix R.

R645-301-742.221.1 INDIVIDUALLY OR IN SERIES

See Appendix R.

R645-301-742.221.2 LOCATION

See Appendix R., Plate 2

**R645-301-742.221.3 DESIGN, CONSTRUCTION AND
MAINTENANCE**

See Appendix R.

R645-301-742.221.31 SEDIMENT STORAGE VOLUME

See Appendix R.

R645-301-742.221.32 DETENTION TIME

See Appendix R.

R645-301-742.221.33 DESIGN EVENT

See Appendix R.

R645-301-742.221.34 DEWATERING DEVICE

See Appendix R.

R645-301-742.221.35 SHORT CIRCUITING

See Appendix R.

R645-301-742.221.36 SEDIMENT REMOVAL

See Appendix R.

R645-301-742.221.37 EXCESSIVE SETTLEMENT

See Appendix R.

R645-301-742.221.38 EMBANKMENT MATERIAL

See Appendix R.

R645-301-742.221.39 COMPACTION

See Appendix R.

R645-301-742.222. MSHA SEDIMENTATION PONDS

N/A

R645-301-742.223. OTHER SEDIMENTATION PONDS

See Appendix R.

R645-301-745.223.1 OPEN CHANNEL SPILLWAY

See Appendix R.

R645-301-742.223.2 LINING

See Appendix R.

R645-301-742.224. TEMPORARY IMPOUNDMENT - EXCEPTION

N/A

R645-301-742.225. EXCEPTION TO LOCATION

N/A

**R645-301-742.225.1. IMPOUNDMENTS MEETING 30 CFR
SEC.77.216(a)**

N/A

R645-301-742.225.2. OTHER MSHA IMPOUNDMENTS

N/A

R645-301-742.230. OTHER TREATMENT FACILITIES

N/A

R645-301-742.231. DESIGN EVENT

N/A

R645-301-742.232. REQUIREMENTS

N/A

R645-301-742.240. EXEMPTIONS

N/A

R645-301-742.300. DIVERSIONS

See Appendix R.

R645-301-742.310. GENERAL REQUIREMENTS

See Appendix R.

R645-301-742.311. REQUIREMENTS

See Appendix R.

R645-301-742.312. DESIGN

See Appendix R.

R645-301-742.312.1 STABILITY

See Appendix R.

R645-301-742.312.2 FLOOD PROTECTION

See Appendix R.

R645-301-742.312.3 SUSPENDED SOLIDS

See Appendix R.

R645-301-742.312.4 COMPLY WITH OTHER REGULATIONS

See Appendix R.

R645-301-742.313. TEMPORARY AND PERMANENT DIVERSIONS

See Appendix R.

R645-301-742.314. ADDITIONAL DESIGN CRITERIA

See Appendix R.

**R645-301-742.320. DIVERSION OF PERENNIAL AND
INTERMITTENT STREAMS**

N/A

R645-301-742.321. BUFFER ZONE REQUIREMENTS

N/A

R645-301-742.322. DESIGN CAPACITY

N/A

R645-301-742.323. DESIGN EVENT

N/A

R645-301-742.324. CERTIFICATION

N/A

R645-301-742.330. DIVERSION OF MISCELLANEOUS FLOWS

See Appendix R.

R645-301-742.331. REQUIREMENTS

See Appendix R.

R645-301-742.332. DESIGN

See Appendix R.

R645-301-742.333. DESIGN EVENT

See Appendix R.

R645-301-742.400. ROAD DRAINAGE

See Appendix R.

R645-301-742.410. ALL ROADS

See Appendix R.

R645-301-742.411. PROTECTION AND SAFETY

See Appendix R.

**R645-301-742.412. INTERMITTENT OR PERENNIAL STREAM
RESTRICTION**

N/A

**R645-301-742.413. DOWNSTREAM SEDIMENTATION AND
FLOODING**

See Appendix R.

R645-301-742.420. PRIMARY ROADS

See Appendix R.,

R645-301-742.421. EROSION PROTECTION

See Appendix R.

R645-301-742.422.

STREAM FORDS

N/A

R645-301-742.423.

DRAINAGE CONTROL

See Appendix R.

R645-301-742.423.1

PRIMARY ROAD DESIGN CRITERIA

See R645-301-512.250.

R645-301-742.423.2

DRAINAGE PIPES AND CULVERTS

See Appendix R.

R645-301-742.423.3

DRAINAGE DITCHES

See Appendix R.

R645-301-742.423.4

NATURAL STREAM CHANNELS

See Appendix R.

R645-301-742.423.5

REQUIREMENTS

See Appendix R.

R645-301-743.

IMPOUNDMENTS

See Appendix R.

R645-301-743.100.

GENERAL REQUIREMENTS

See Appendix R.

R645-301-743.110.

MSHA IMPOUNDMENTS

N/A

R645-301-743.120.

**CERTIFICATION AND FREEBOARD
REQUIREMENTS**

See Appendix R.

R645-301-743.130. SPILLWAYS

See Appendix R.

R645-301-743.131. APPROVAL OF SINGLE OPEN CHANNEL SPILLWAY

The Division may approve a single-open channel spillway that is:

R645-301-743.131.1. NON-ERODIBLE CONSTRUCTION

See Appendix R

R645-301-743.131.2. EARTH- OR GRASS-LINED WITH NON-EROSIVE FLOWS

N/A

R645-301-743.131.3. REQUIRED DESIGN EVENT

See Appendix R

R645-301-743.131.4. NRCS CLASS B OR C DAMS

N/A

R645-301-743.131.5. MSHA IMPOUNDMENTS

N/A

R645-301-743.131.6. NON-MSHA IMPOUNDMENTS

See Appendix R

R645-301-743.132. ALTERNATE SEDIMENT POND CRITERIA

N/A

R645-301-743.140. INSPECTIONS

See Appendix R.

R645-301-743.200. SPILLWAY DESIGN EVENT FOR

PERMANENT IMPOUNDMENTS

See Appendix R.

**R645-301-743.300. SPILLWAY DESIGN EVENT FOR
TEMPORARY IMPOUNDMENTS**

See Appendix R.

R645-301-744. DISCHARGE STRUCTURES

See Appendix R.

R645-301-744.100. EROSION CONTROL

See Appendix R.

R645-301-744.200. DESIGN

See Appendix R.

R645-301-745. DISPOSAL OF EXCESS SPOIL

See R645-301-512.230.

R645-301-745.100. GENERAL REQUIREMENTS

See R645-301-512.230.

R645-301-745.110. DISPOSAL AREA

See R645-301-512.230.

**R645-301-745.111. EFFECTS ON SURFACE AND GROUND
WATER**

See R645-301-512.230.

R645-301-745.112. IMPOUNDMENTS ON FILL

N/A

R645-301-745.113. COVER

See R645-301-512.230.

R645-301-745.120.

DRAINAGE CONTROL

N/A

R645-301-745.121.

DIVERSIONS

N/A

R645-301-745.122.

UNDERDRAINS

N/A

R645-301-745.200.

**VALLEY FILLS AND HEAD-OF-HOLLOW
FILLS**

N/A

R645-301-745.210.

REQUIREMENTS

N/A

R645-301-745.220.

DRAINAGE CONTROL

N/A

R645-301-745.221.

RESTRICTIONS

N/A

R645-301-745.222.

RUNOFF CONTROL

N/A

R645-301-745.300.

DURABLE ROCK FILLS

N/A

R645-301-745.310.

REQUIREMENTS

N/A

R645-301-745.320.

UNDERDRAINS

N/A

R645-301-745.330.

RUNOFF CONTROL

N/A

R645-301-745.400.

PRE-EXISTING BENCHES

N/A

R645-301-746.

COAL MINE WASTE

See R645-301-512.230.

R645-301-746.100.

GENERAL REQUIREMENTS

See R645-301-512.230.

R645-301-746.110.

PLACEMENT

See R645-301-512.230.

R645-301-746.120.

**EFFECTS ON SURFACE AND GROUND
WATER**

See R645-301-512.230.

R645-301-746.200.

REFUSE PILES

See R645-301-513.400.

R645-301-746.210.

REQUIREMENTS

See R645-301-513.400.

R645-301-746.211.

SEEPS AND SPRINGS

N/A

R645-301-746.212.

UNCONTROLLED SURFACE DRAINAGE

N/A

R645-301-746.213.

UNDERDRAINS

N/A

R645-301-746.220.

SURFACE AREA STABILIZATION

N/A

R645-301-746.221.

SLOPE PROTECTION

N/A

R645-301-746.222.

IMPOUNDMENT RESTRICTIONS

N/A

R645-301-746.300.

IMPOUNDING STRUCTURES

N/A

R645-301-746.310.

COAL MINE WASTE

See R645-301-512.230.

R645-301-746.311.

REQUIREMENTS

See R645-301-512.230.

R645-301-746.312.

MSHA IMPOUNDING STRUCTURE

N/A

R645-301-746.320.

SPILLWAYS AND OUTLET WORK

N/A

R645-301-746.330.

DRAINAGE CONTROL

N/A

R645-301-746.340.

WATER STORAGE

N/A

R645-301-746.400.

**RETURN OF COAL PROCESSING WASTE TO
ABANDONED UNDERGROUND WORKINGS**

N/A

R645-301-746.410.

HYDROLOGIC IMPACTS

N/A

R645-301-746.420.

MONITORING WELLS

N/A

R645-301-746.430.

PNEUMATIC BACKFILLING

N/A

R645-301-747.

DISPOSAL OF NON-COAL MINE WASTE

See R645-301-512.230.

R645-301-747.100.

REQUIREMENTS

See R645-301-512.230.

R645-301-747.200.

PLACEMENT AND STORAGE

See R645-301-512.230.

R645-301-747.300.

FINAL DISPOSAL

See R645-301-512.230.

R645-301-748.

CASING AND SEALING OF WELLS

N/A

R645-301-750.

PERFORMANCE STANDARDS

All coal mining and reclamation operations will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and support approved postmining land uses in accordance with the terms and conditions of the

approved permit and the performance standards of R645-301 and R645-302.

**R645-301-751. WATER QUALITY STANDARDS AND
EFFLUENT LIMITATIONS**

Discharges or water from areas disturbed by coal processing and reclamation operations will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

R645-301-752. SEDIMENT CONTROL MEASURES

Sediment control measures must be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-512.240, R645-301-732, R645-301-742 and R645-301-760.

**R645-301-752.100. SILTATION STRUCTURES AND
DIVERSIONS**

See Appendix R.

R645-301-752.200. ROAD DRAINAGE

See R645-301-512.250.

R645-301-752.210. CONTROL OF EROSION AND POLLUTION

See Appendix R.

R645-301-752.220. CONTROL OF SUSPENDED SOLIDS

See Appendix R.

R645-301-752.230. COMPLIANCE WITH EFFLUENT STANDARDS

See Appendix R.

**R645-301-752.240. MINIMIZE DIMINUTION OF DEGRADATION
OF WATER QUALITY**

See Appendix R.

**R645-301-752.250. ALTERATION OF STREAM FLOW OR
CHANNELS**

See Appendix R.

**R645-301-753. IMPOUNDMENTS AND DISCHARGE
STRUCTURES**

See Appendix R.

**R645-301-754. DISPOSAL OF EXCESS SPOIL, COAL
MINE WASTE AND NON-COAL MINE WASTE**

See R645-301-512.230.

R645-301-755. CASING AND SEALING OF WELLS

N/A

R645-301-760. RECLAMATION

See R645-301-240.

R645-301-761. GENERAL REQUIREMENTS

See R645-301-240.

R645-301-762. ROADS

See R645-301-512.250.

**R645-301-762.100. RESTORING NATURAL DRAINAGE
PATTERNS**

N/A

R645-301-762.200. REGRADING

See R645-301-532.200.

R645-301-763. SILTATION STRUCTURES

See Appendix R.

R645-301-763.100.

RESTRICTIONS

See Appendix R.

R645-301-763.200.

REQUIREMENTS

See Appendix R.

R645-301-764.

STRUCTURE REMOVAL

See R645-301-240.

R645-301-765.

**PERMANENT CASING AND SEALING OF
WELLS**

N/A

GENERALIZED STRATIGRAPHIC SECTION
FOR THE
CENTRAL AND SOUTHERN PART
OF THE
KASATCH PLATEAU

(AFTER DOELLING, 1972 MONOGRAPH SERIES)

System	Stratigraphic Unit	Thickness (feet)	Description
Tertiary	WASATCH GROUP North Horn Formation	500 - 2,500	Variegated shales with subordinate sandstone, conglomerate and fresh-water limestone, slope former; sandstone and limestone units may supply limited quantities of ground water.
Cretaceous	PRICE RIVER GROUP Price River Formation	600 - 1,000	Gray to white gritty sandstone interbedded with subordinate shale and conglomerate, ledge and slope former, little potential for ground water.
	CASTLEGATE GROUP Castlegate Sandstone	150 - 500	White to gray, coarse-grained often conglomeratic sandstone, cliff former, weathers to shades of brown, good aquifer material, ground water not present if outcrops occur nearby.
	(Unconformity)		
	MESA VERDE GROUP Blackhawk Formation MAJOR COAL SEAMS	700 - 1,000	Yellow to gray, fine-to-medium-grained sandstone, interbedded with subordinate gray and carbonaceous shale, several thick coal seams; perched ground water may occur in sandstone units, springs and seeps common.
	Star Point Sandstone	90 - 1,000	Yellow-gray massive cliff-forming sandstone, often in several tongues separated by Masuk Shale; ground water present, but generally a poor aquifer.
	Masuk Shale	300 - 1,300	Yellow to blue-gray sandy shale, slope former.
	EMERY GROUP Emery Sandstone COAL	50 - 800	Yellow-gray friable sandstone tongue, cliff former. Coal present in subsurface; major regional aquifer.
	Blue Gate Member	1,500- 2,400	Pale blue-gray, nodular and irregularly bedded marine mudstone and siltstone with several arenaceous beds, weathers into low rolling hills and badlands.
	Ferron Sandstone Member MAJOR COAL SEAMS	50 - 950	Alternating yellow-gray sandstone, sandy shale and gray shale with important coal beds of Emery coal field, resistant cliff former; major regional aquifer.
	Tununk Shale Member	400 - 650	Blue-gray to black sandy marine shale slope forming mudston

Figure VII-1

CHAPTER 8

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CHAPTER 8, BONDING

NOTE TO REVIEWERS: The Wildcat MRP was recently re-formatted to the newer R645 regulations. This reformatted MRP was recently approved and incorporated on May 17, 2006. The current amendment is referred to as the 2007 Modification Plan and consists of three components, namely; 1) addressing Division Order DO-04 regarding wind-blown fines, 2) expanding the primary coal storage pad by about 3.5 acres, and 3) provide for a new material storage area of about 6 acres located on the west side of the facility.

Because the Wildcat MRP was recently reformatted and approved, every effort has been made in this amendment to minimize text changes, as pertains to responses to specific regulations, except where necessary to avoid inconsistencies and contradictions. Where possible, response to individual regulations regarding the proposed 2007 Modification Plan amendment have been made by referring the reviewer directly to Appendix S. This appendix contains a detailed description of the amendment and is presented in a narrative that integrates the various components which are normally addressed in the separate chapters. Within the chapters themselves, all new discussion relevant to the 2007 Modification Plan amendment is presented in italics to easily differentiate it from the previously approved and reformatted text. The submittal also utilizes the standard "redline/strike-out" to aid in the review

R645-301-800. BONDING AND INSURANCE

Andalex Resources, Inc. currently holds a bond in the form of an irrevocable Letter of Credit, calculated and approved by the Division, in the amount of \$651,000.00. This bond, and all supporting calculations, is included in this MRP in Appendix B. *Additional bonding associated with the 2007 Modification Plan will be posted after consultation with the Division.*

It should be noted that only major headings and information specific to the Andalex Wildcat Bond and Insurance are included in this chapter. If a major heading is noted "N/A" or "By Division" all subsequent headings in that series are also assumed "N/A" or "By Division".

**R645-301-810. BONDING DEFINITIONS AND DIVISION
RESPONSIBILITIES**

BY DIVISION

R645-301-820. REQUIREMENT TO FILE A BOND

Andalex currently holds a bond (irrevocable letter of credit), approved by UDOGM in the amount of \$651,000.00 and it is included in this MRP in Appendix B.

See also Appendix B and Plates 8 & 9.

R645-301-830. DETERMINATION OF BOND AMOUNT

The bond amount has been determined through joint effort by Andalex Resources, Inc. and the Division. The present amount of bond is \$651,000.00. Complete calculations are included in Appendix B. Bonded areas are shown on Plates 1A, 9 and 13C, and further described in R645-301-542. *Additional bonding associated with the 2007 Modification Plan will be posted after consultation with the Division. The primary factors (other than inflation) used in determining the new bonding resulting from the 2007 Modification Plan are:*

1) The cut/fill earthwork volumes have increased from 74,000 cu. yds. To 80,000 cu. yds.

2) The area to be revegetated has increased from 60.94 acres to 81.79 acres.

3) There will be no new structures which will be required to be demolished.

**R645-301-840. GENERAL TERMS AND CONDITIONS OF
THE BOND**

All pertinent bond information and details are included in Appendix B.

**R645-301-850. BONDING REQUIREMENTS FOR
UNDERGROUND MINING OPERATIONS**

Appendix B

R645-301-860.

FORMS OF BONDS

Appendix B - Letter of Credit

R645-301-860.200

COLLATERAL BONDS

Appendix B - Letter of Credit

R645-301-860.220

LETTERS OF CREDIT

Appendix B - Letter of Credit

(Note: All other sections of R645-301-860 except those noted are N/A).

R645-301-870.

REPLACEMENT OF BONDS

N/A

R645-301-880.

REQUIREMENT TO RELEASE PERFORMANCE BONDS

N/A -- UNTIL FINAL RECLAMATION

R645-301-890.

TERMS AND CONDITIONS FOR LIABILITY INSURANCE

Required Liability Insurance Policy and information is included in Appendix B.

VERIFICATION STATEMENT

STATE OF UTAH)

SS:

COUNTY OF CARBON)

I, David E Shaver, having been duly sworn, depose and attest that all of the representations contained in the foregoing application and true, accurate and complete to the best of my knowledge; that I am authorized to complete and file this application on behalf of the Applicant and this application has been executed as required by law.

Signed: _____

Taken, subscribed and sworn to me before the undersigned authority in my said county, this _____ day of _____, 20____.

Notary Public: _____

My Commission Expires: _____

VERIFICATION STATEMENT

STATE OF UTAH)
 SS:
COUNTY OF CARBON)

I, David E Shaver, having been duly sworn, depose and attest that all of the representations contained in the foregoing application and true, accurate and complete to the best of my knowledge; that I am authorized to complete and file this application on behalf of the Applicant and this application has been executed as required by law.

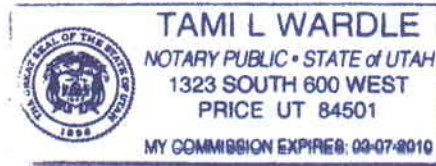
Signed: _____

Taken, subscribed and sworn to me before the undersigned authority in my said county, this 8 day of may, 2007.

Notary Public: _____

My Commission Expires: _____

03-07-2010



APPENDIX A
(SUPPLEMENT)

ARCHEOLOGY REPORTS
FOR THE
2007 MODIFICATION PLAN AREA:

- a) COAL PAD EXPANSION AREA
- b) MATERIAL STORAGE AREA

SENCO-PHENIX



SENCO-PHENIX

**An Intensive Cultural Resource Survey and Inventory of the
Wildcat Loadout Expansion Block Area**

**Carbon County, Utah
(BLM Land)**

**PERFORMED FOR
UtahAmerican Energy, Inc.**

**In Accordance with
Utah State Guidelines
Antiquities Permit #U06SC1475b**

**SPUT-540
October 20, 2006**

John A. Senulis

Direct Charge of Fieldwork

UTAH SHPO

COVER SHEET

Project Name: **An Intensive Cultural Resource Survey and Inventory of the Wildcat Loadout Expansion Block Area**

UTAHAMERICAN Energy, Inc.

State # U06SC1475b

Report Date: October 20, 2006

County (ies): Carbon,

Principal Investigator/ Field Supervisor: John A. Senulis/John Senulis

Records Search/Location/Dates: October 11, Price River Field Office of the BLM

Acreage Surveyed: 55 acres

Intensive Acres: 55

Recon/Intuitive Acres: 0

U.S.G.S. 7.5 Quads: Standardville, UT (1972)

Sites Reported	Number	Smithsonian Site #(s):
Archeological Sites:	0	
Revisit (No IMACS update)	0	
Revisit (IMACS update attch.)	0	
New Sites (IMACS attached)	0	
Archeological Site Total:	0	
Historic Structures:	0	
(USHS Site Form Attached)		
Total NRHP Eligible Sites,	0	

Checklist of Required Items:

1. X 1 Copy of Final Report
2. X Copy of U.S.G.S. 7.5' map showing surveyed/excavated area
3. Completed IMACS Site Inventory Forms Including
 - _____ Parts A and B or C
 - _____ IMACS Encoding Form
 - _____ Site Sketch Map
 - _____ Photographs
 - _____ Copy of USGS 7.5' Quad with Smithsonian site Number
4. X Completed Cover Sheet

**Summary Report of Cultural
Resources Inspection**

State Proj. No: # U06SC1475b

1. Report Title: **An Intensive Cultural Resource Survey and Inventory of the
Wildcat Loadout Expansion Block Area**

2. Report Date: October 20, 2006 3. Date(s) of Survey: October 13, 16, 2006

3. Development Company: **UTAHAMERICAN Energy, Inc.**

4. Responsible Institution: **SENCO-PHENIX**

6. Responsible Individuals

Principal Investigator: John Senulis

Field Supervisor: John Senulis

Report Author(s): John Senulis

7. BLM Field Office: **Price River Field Office**

8. County (ies): **Carbon**

9. Fieldwork Location:

USGS Map: **Standardville, Utah (1972)**

Twn: 13S Range: 9E Section: 33

Twn: Range: Section:

Twn: Range: Section:

10. Record Search:

Location of Records Searched: **Price Field Office**

Date of Record Search: **October 11, 2006**

11. Description of Examination Procedures: **Class III walkover inventory with transects spaced no further than 15 meters**

12. Area Surveyed:

		BLM	OTHER FED	STATE	PRIVATE
Linear Miles	Intensive:				
	Recon/Intuitive:				
Acreage	Intensive:	55			
	Recon/Intuitive:				

13. Sites Recorded:

		BLM		OTHER FED		STATE		PRIVATE	
		#	Smithsonian Site Numbers	#	Smithsonian Site Numbers	#	Smithsonian Site Numbers	#	Smithsonian Site Numbers
Revisits (no IMACS form)	NR Eligible								
	Not Eligible								
Revisits (updated IMACS)	NR Eligible								
	Not Eligible								
New Recordings (IMACS)	NR Eligible								
	Not Eligible								

Total Number of Archeological Sites: 0

Historic Structures (USHS Form):

Total National Register Eligible Sites: 0

14. Description of Findings:

15. Collection Yes___ No x_

(If Yes) Curation Facility:

Accession Number(s):

16. Conclusion/Recommendations: Archeological Clearance without stipulations

Abstract

SENCO-PHENIX performed an intensive cultural resource survey on the Wildcat Loadout Expansion area. The proposed Loadout expansion is located on BLM land. The purpose of the survey was to identify and evaluate cultural resources that may exist within the project area.

Cultural resources were located in the form of IF 1, an isolated prehistoric core or worked chunk of tan/brown chalcedony measuring 47 by 39 by 16 mms. The core was found on the downhill sloping flats and may have washed in from another location. The location was 507720 mE, 4388498 mN.

No other cultural resources were located and the potential for undetected remains is remote. A finding of No Effect is appropriate and Archeological Clearance is recommended.

Project Location

The survey area is in the SE ¼ of Section 33, Township 13 South, Range 9 East, Carbon County, Utah. The project area is shown on the enclosed copy of U.S.G.S. 7.5' Quad: Standardville, Utah (1972). The location was not staked but was located through the use of UTM coordinates taken from the ArcView program and applied with a gps unit in the field.

Specific Environment

The survey area is on a sloping bench overlooking the Garley Canyon intermittent drainage. Soils are tan gravelly clay loams that erode into deep, intermittent stream channels. Vegetation is low to medium sagebrush with assorted grasses, forbs and shrubs. There is a stand of Pinyon-juniper in the north end of the project area. There is no permanent water in the project area. The area is heavily used by modern populations with many ATV trails and anomalies like a ca. 15-inch stone circle marked "RIP Bert.....the best cat...2005."

Previous Research

A file search of the SENCO-PHENIX reports and at the BLM Price Field Office on October 11, 2006, indicated that the following projects had been performed:

- 1981, Antiquities Section, Utah Division of State History, surveyed the Wildcat Loadout location. No significant cultural resources were located. (81-28)
- 1984, Abajo Archeology surveyed a seismic line just north of the project area. No cultural resources were located. (84-24)
- 1985, The BLM surveyed a road reroute in Section 33, Archeological site 42CB445 was located. The site is a stone lined cist that is not eligible for the NRHP.
- 1986, BYU surveyed a block area north of the current project area. No cultural resources were located. (86-483)
- 1986, BYU surveyed a gravel pit north of the current project area. Cultural resources were located in the form of 42CB532, a non-significant lithic scatter. (86-43)
- 2001, SENCO-PHENIX surveyed several well pads and access corridors in the project area. No significant cultural resources were located in or near the project area. (01-153, 176)
- 2005, Montgomery Archeological Consultants surveyed an extensive block area. No significant cultural resources were discovered near the current project area. (04-1429)

Methodology

John & Jeanne Senulis of SENCO-PHENIX performed a Class III intensive walkover survey of the proposed 55-acre unsurveyed expansion area on October 13, 16, 2006. Meandering parallel transects no further spaced than 15 meters were employed. Special attention was given to areas of subsurface soil exposure from animal burrowing, and erosion. The survey area was plotted utilizing a gps unit. The data was transferred to the ArcView map program. All field notes are on file at the offices of SENCO-PHENIX in Price, Utah.

Findings and Recommendations

Cultural resources were located in the form of IF 1, an isolated prehistoric core or worked chunk of tan/brown chalcedony measuring 47 by 39 by 16 mms. The core was found on the downhill sloping flats and may have washed in from another location. The location was 507720 mE, 4388498 mN.

No other cultural resources were located and the potential for undetected remains is remote. A finding of No Effect is appropriate and Archeological Clearance is recommended.

These recommendations are subject to approval by the BLM Price Field Office Manager and the Utah SHPO.

References

Billat, Scott E.

1986 *An Archeological Inventory of the Lowdermilk Gravel Pit, Southwest of Helper, Carbon County, Utah*, Brigham Young University Museum of Peoples and Cultures Technical Series No. 86-18, Provo, Utah.

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1981 *Archeological Survey of the Coal Train Loading Facility*, Antiquities Section, Utah Division of State History, Salt Lake City, Utah.

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Hall, Michael J.

1986 *An Archeological Inventory of the Proposed Chinook Coal Company Loadout Near Wildcat Canyon, Carbon County, Utah*. Brigham Young University Museum of Peoples and Cultures Technical Series No. 86-46, Provo, Utah.

Miller, Blaine

1985 *Wildcat Road Reroute*, BLM, Price, Utah

Mrstik, Jessica & Keith Montgomery

2005 *Cultural Resource Inventory of Division of Wildlife Resources BLM Treatment Plan, Carbon County, Utah*, Montgomery Archeological Consultants, Inc, Moab, Utah.

Senulis, John A.

2001a *Intensive Cultural Resource Survey and Inventory of the USA 03-301, USA 04-469, Utah 34-510, Utah 34-512 and Ritzakis 33-516 Well pads and Access Corridors in the Consumers Bench Area of River Gas Coal Methane Field*, SENCO-PHENIX Archeological Consultants, Price, Utah.

2001b *An Intensive Cultural Resource Survey and Inventory of the USA 03-301, Ritzakis 33-514 Well Pads and Access Corridors and the Wildcat Access Corridor in the Phillips Petroleum Coalbed Gas Methane Field*, SENCO-PHENIX Archeological Consultants, Price, Utah



SENCO-PHENIX

An Intensive Cultural Resource Survey and Inventory of the Material Storage Area for Wildcat Loadout

**Carbon County, Utah
(BLM Land)**

**PERFORMED FOR
UtahAmerican Energy, Inc.**

**In Accordance with
Utah State Guidelines
Antiquities Permit #U07SC0272b**

**SPUT-551
April 2, 2007**

John A. Senulis

Direct Charge of Fieldwork

UTAH SHPO

COVER SHEET

Project Name: **An Intensive Cultural Resource Survey and Inventory of the Material Storage Area for Wildcat Loadout**

UTAHAMERICAN Energy, Inc.

State # U07SC0272b

Report Date: April 2, 2007

County (ies): Carbon,

Principal Investigator/ Field Supervisor: John A. Senulis/John Senulis

Records Search/Location/Dates: October 11, 2006, March 30, 2007, Price River Field Office of the BLM

Acreage Surveyed: 15 acres

Intensive Acres: 15

Recon/Intuitive Acres: 0

U.S.G.S. 7.5 Quads: Standardville, UT (1972)

Sites Reported	Number	Smithsonian Site #(s):
Archeological Sites:	1	42CB2620
Revisit (No IMACS update)	0	
Revisit (IMACS update attch.)	0	
New Sites (IMACS attached)	1	42CB2620
Archeological Site Total:	1	42CB2620
Historic Structures:	0	
(USHS Site Form Attached)		
Total NRHP Eligible Sites,	0	

Checklist of Required Items:

1. X 1 Copy of Final Report
2. X Copy of U.S.G.S. 7.5' map showing surveyed/excavated area
3. Completed IMACS Site Inventory Forms Including
 - X Parts A and B or C
 - X IMACS Encoding Form
 - X Site Sketch Map
 - X Photographs
 - X Copy of USGS 7.5' Quad with Smithsonian site Number
4. X Completed Cover Sheet

**Summary Report of Cultural
Resources Inspection**

State Proj. No: # U07SC0272b

1. Report Title: **An Intensive Cultural Resource Survey and Inventory of the Material Storage Area for Wildcat Loadout**

2. Report Date: April 2, 2007

3. Date(s) of Survey: March 30, 2007

3. Development Company: **UTAHAMERICAN Energy, Inc.**

4. Responsible Institution: **SENCO-PHENIX**

6. Responsible Individuals

Principal Investigator: John Senulis

Field Supervisor: John Senulis

Report Author(s): John Senulis

7. BLM Field Office: Price River Field Office

8. County (ies): Carbon

9. Fieldwork Location:

USGS Map: Standardville, Utah (1972)

Twn: 13S Range: 9E Section: 33

Twn: Range: Section:

Twn: Range: Section:

10. Record Search:

Location of Records Searched: Price Field Office

Date of Record Search: October 11, 2006, March 30, 2007

11. Description of Examination Procedures: Class III walkover inventory with transects spaced no further than 15 meters

12. Area Surveyed:

		BLM	OTHER FED	STATE	PRIVATE
Linear Miles	Intensive:				
	Recon/Intuitive:				
Acreage	Intensive:	15			
	Recon/Intuitive:				

13. Sites Recorded:

		BLM		OTHER FED		STATE		PRIVATE	
		#	Smithsonian Site Numbers	#	Smithsonian Site Numbers	#	Smithsonian Site Numbers	#	Smithsonian Site Numbers
Revisits (no IMACS form)	NR Eligible								
	Not Eligible								
Revisits (updated IMACS)	NR Eligible								
	Not Eligible								
New Recordings (IMACS)	NR Eligible								
	Not Eligible		42CB2620						

Total Number of Archeological Sites: 1

Historic Structures (USHS Form):

Total National Register Eligible Sites: 0

14. Description of Findings:

15. Collection Yes ___ No x_

(If Yes) Curation Facility:

Accession Number(s):

16. Conclusion/Recommendations: Archeological Clearance without stipulations

Abstract

SENCO-PHENIX performed an intensive cultural resource survey on the Material Storage Area for Wildcat Loadout. The proposed Material Storage Area is located on BLM land. The purpose of the survey was to identify and evaluate cultural resources that may exist within the project area.

Cultural resources were located in the form of one new historic archeological site and six isolated finds:

- 42CB2620: The site is historic trash scatter with a preponderance of alcoholic beverage containers. There is some evidence of food preparation and the site may have been a short term hunting camp. The artifacts include glass and tin cans scattered over a 6-meter (12 feet) diameter area. Artifacts include 35+ steel 12 ounce beverage (beer) cans opened with a church key; 1-6 and 1-8 ounce sanitary cans opened with an opener; 3 sanitary lids; 4 punched open evaporated milk cans; 2 aerosol cans; a 12 ounce salt shaker and a rectangular pepper tin. Glass included 6-12 ounce beer bottles with "No Deposit, No Return," on the neck and "Not to be Refilled," on the base; 2 broken, brown whiskey bottles with "Jos E Seagram and Sons, LTD, Canada embossed on the base; a clear glass ketchup bottle with "57" embossed on the base of the neck and H-257 embossed on the base. All of the glass bases had the maker's mark of an "I" in a circle, which is the mark of the Owens Illinois Glass Company used since 1954. There were 3 12-gauge shotgun shell casings.

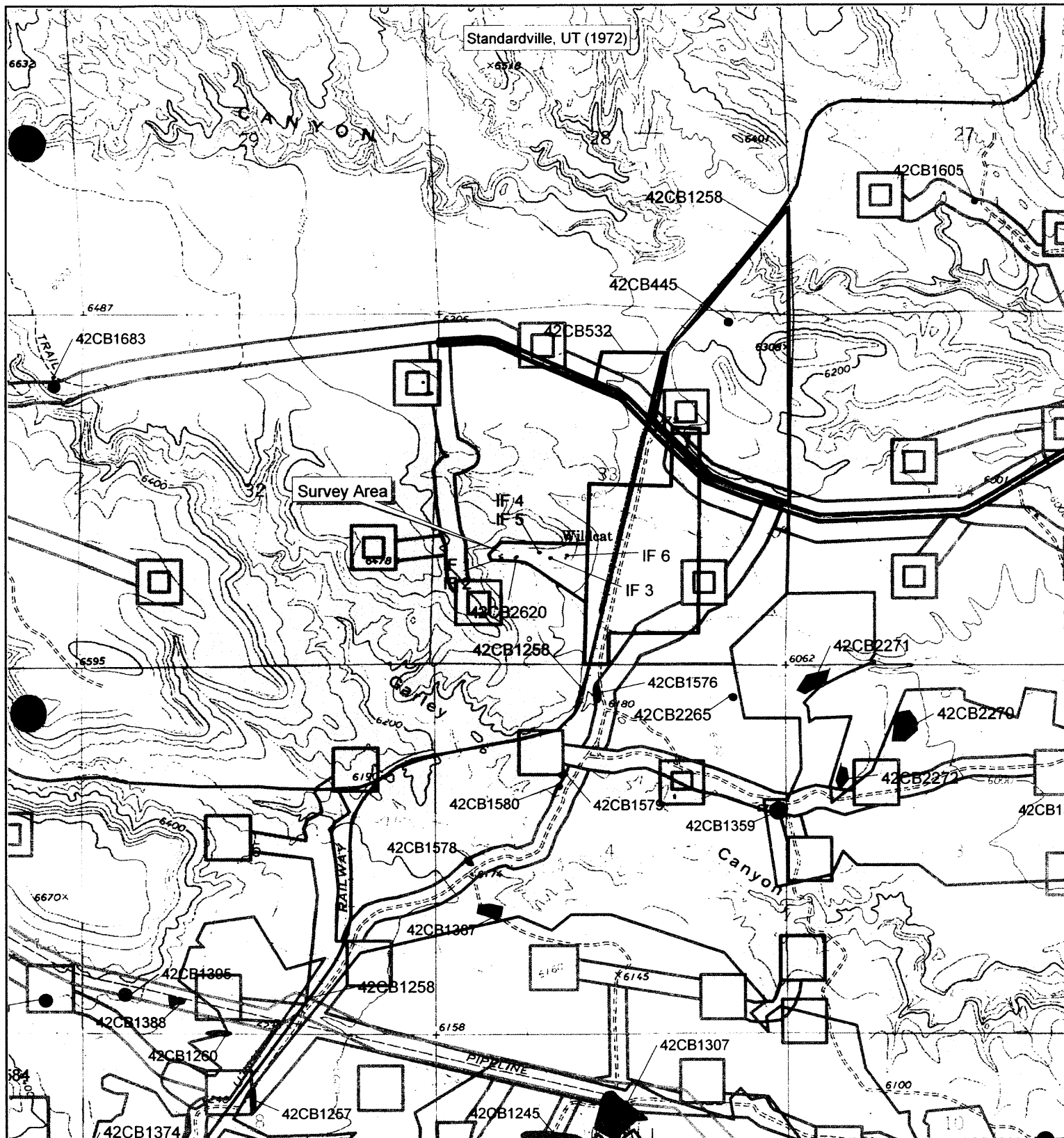
The site has no constructed features, structures or apparent associations; there is little potential for additional information. The site is a surficial trash scatter with no evidence of buried remains and a surface modified by erosion that has altered the original context. The historic context is mid Twentieth Century. Historic trash scatters are common in this area and in the state of Utah. There is no event (a) or person (b) that can be associated with the site so those criteria are not applicable. The site is a trash scatter with no planning associated with the deposition and lack of constructed features means the site is not eligible under the criterion for design /construction (c). The site was used intermittently and the waste products that remain have been identified and any remaining artifacts are not suitable to provide additional information important to history and the site is not eligible under criterion (d).


- IF 1 is an aqua bottle base and neck that are mold made. The base has a series of five concentric circles embossed on the outer edge. They were located at 506465 mE and 4388623 mN.
- IF 2 is two aqua bottlenecks and a fragment of the bottle side. They were mold made with no markings. They were located at 506477 mE and 4388629 mN.
- IF 3 is a double ended pick head measuring 23 inches long by 2 ¼ inch high with a tapering handle hole measuring 1 by 3 inches. It was located at 506692 mE and 4388581 mN.
- IF 4 is four fragments of aqua glass, two of which are bases. One of the bases is embossed with a joined "AB" the mark of Adolphus Busch Glass Manufacturing Company and used between 1904-1907 (Toulouse 1971:26). They were located at 506414 mE and 4388738 mN.

- IF 5 is a 14-ounce sanitary can that has been cut around on the top and punched on the bottom. It was nailed to a juniper tree with a wire nail. It was located at 506495 mE and 4388738 mN.
- IF 6 is a coffee can lid, a punched open evaporated milk can and a hinged tobacco tin. They were located at 506442 mE and 4388785 mN.

Much of the project area has been disturbed by harrowing or other activity and there are isolated sanitary tin cans on the disturbed surface. The disturbance also explains the widely dispersed aqua glass, which is all of a similar typology. Exceptions to the disturbance are small hillocks with dispersed juniper and along the banks of the intermittent streambed where site 42CB2620 was located.

No other cultural resources were located and the potential for undetected remains is remote. A finding of No Effect is appropriate and Archeological Clearance is recommended.





SENCO-PHENIX

N



Scale 1:24,000
1"= 2,000'

	Current Survey
	Previous Survey
	Montgomery Survey
	SWCA Survey
	Other Survey
	Eligible Sites
	Ineligible Sites

Material Storage Area
Wildcat Loadout
UtahAmerican Energy, Inc.
Section 33, T13S, R9E
Carbon County, Utah
March 2007
SPUT-551

Project Location

The irregular 15-acre survey area is in the SW ¼ of Section 33, Township 13 South, Range 9 East, Carbon County, Utah. The project area is shown on the enclosed copy of U.S.G.S. 7.5' Quad: Standardville, Utah (1972). The location was not staked but was located through the use of UTM coordinates taken from the ArcView program and applied with a gps unit in the field.

Specific Environment

The survey area is on a sloping bench overlooking the Garley Canyon intermittent drainage. Soils are tan gravelly clay loams that erode into deep, intermittent stream channels. Much of the project area has been disturbed by harrowing or other activity and there are isolated sanitary tin cans on the disturbed surface. Exceptions to the disturbance are small hillocks with dispersed juniper and along the banks of the intermittent streambed where site 42CB2620 was located.

Vegetation is low to medium drought killed sagebrush with assorted grasses, forbs and shrubs. There are clumps of an unknown introduced grass throughout the project area. There is no permanent water in the project area.

Previous Research

A file search of the SENCO-PHENIX reports and at the BLM Price Field Office on October 11, 2006, supplemented on March 30, 2007 indicated that the following projects had been performed:

- 1981, Antiquities Section, Utah Division of State History, surveyed the Wildcat Loadout location. No significant cultural resources were located. (81-28)
- 1984, Abajo Archeology surveyed a seismic line just north of the project area. No cultural resources were located. (84-24)
- 1985, The BLM surveyed a road reroute in Section 33, Archeological site 42CB445 was located. The site is a stone lined cist that is not eligible for the NRHP.
- 1986, BYU surveyed a block area north of the current project area. No cultural resources were located. (86-483)
- 1986, BYU surveyed a gravel pit north of the current project area. Cultural resources were located in the form of 42CB532, a non-significant lithic scatter. (86-43)
- 2001, SENCO-PHENIX surveyed several well pads and access corridors near the project area. No significant cultural resources were located in or near the project area. (01-153, 176)
- 2002, SENCO-PHENIX surveyed several well pads and access roads adjacent to the project area. No significant cultural resources were located. (02-29)
- 2005, Montgomery Archeological Consultants surveyed an extensive block area. No significant cultural resources were discovered near the current project area. (04-1429)
- 2006, SENCO-PHENIX surveyed a block area east of the current project area. No significant cultural resources were discovered. (06-1475)

Methodology

John & Jeanne Senulis of SENCO-PHENIX performed a Class III intensive walkover survey of the proposed 15-acre material storage area on March 31, 2007. Meandering parallel transects no further spaced than 15 meters were employed. Special attention was given to areas of subsurface soil exposure from animal burrowing, and erosion. The sandstone bluffs at the north end of the project area were closely examined for rock art. When a site was located, the artifacts were pinflagged and the site was photographed. The site was plotted using a WAAS enabled GPS unit. The readings were then transferred to the ArcView mapping program as a permanent database. The survey area was also plotted utilizing a gps unit and the data was transferred to the ArcView map program. All field notes and photographs are on file at the offices of SENCO-PHENIX in Price, Utah.

Findings and Recommendations

Cultural resources were located in the form of one new historic archeological site and six isolated finds:

- 42CB2620: The site is historic trash scatter with a preponderance of alcoholic beverage containers. There is some evidence of food preparation and the site may have been a short term hunting camp. The artifacts include glass and tin cans scattered over a 6-meter (12 feet) diameter area. Artifacts include 35+ steel 12 ounce beverage (beer) cans opened with a church key; 1-6 and 1-8 ounce sanitary cans opened with an opener; 3 sanitary lids; 4 punched open evaporated milk cans; 2 aerosol cans; a 12 ounce salt shaker and a rectangular pepper tin. Glass included 6-12 ounce beer bottles with "No Deposit, No Return," on the neck and "Not to be Refilled," on the base; 2 broken, brown whiskey bottles with "Jos E Seagram and Sons, LTD, Canada embossed on the base; a clear glass ketchup bottle with "57" embossed on the base of the neck and H-257 embossed on the base. All of the glass bases had the maker's mark of an "I" in a circle, which is the mark of the Owens Illinois Glass Company used since 1954. There were 3 12-gauge shotgun shell casings.

The site has no constructed features, structures or apparent associations; there is little potential for additional information. The site is a surficial trash scatter with no evidence of buried remains and a surface modified by erosion that has altered the original context. The historic context is mid Twentieth Century. Historic trash scatters are common in this area and in the state of Utah. There is no event (a) or person (b) that can be associated with the site so those criteria are not applicable. The site is a trash scatter with no planning associated with the deposition and lack of constructed features means the site is not eligible under the criterion for design /construction (c). The site was used intermittently and the waste products that remain have been identified and any remaining artifacts are not suitable to provide additional information important to history and the site is not eligible under criterion (d).

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Much of the project area has been disturbed by harrowing or other activity and there are isolated sanitary tin cans on the disturbed surface. The disturbance also explains the widely dispersed aqua glass, which is all of a similar typology. Exceptions to the disturbance are small hillocks with dispersed juniper and along the banks of the intermittent streambed where site 42CB2620 was located.

No other cultural resources were located and the potential for undetected remains is remote. A finding of No Effect is appropriate and Archeological Clearance is recommended.

These recommendations are subject to approval by the BLM Price Field Office Manager and the Utah SHPO.

References

Billat, Scott E.

1986 *An Archeological Inventory of the Lowdermilk Gravel Pit, Southwest of Helper, Carbon County, Utah*, Brigham Young University Museum of Peoples and Cultures Technical Series No. 86-18, Provo, Utah.

Dobra, Lorraine

1981 *Archeological Survey of the Coal Train Loading Facility*, Antiquities Section, Utah Division of State History, Salt Lake City, Utah.

Davis, William

1984 *Cultural Resource Inventory of the Proposed NORPAC Exploration Services. Inc. Seismographic Transect EU-8*, Carbon County, Utah, Abajo Archeology, Bluff, Utah.

Hall, Michael J.

1986 *An Archeological Inventory of the Proposed Chinook Coal Company Loadout Near Wildcat Canyon, Carbon County, Utah*. Brigham Young University Museum of Peoples and Cultures Technical Series No. 86-46, Provo, Utah.

Miller, Blaine

1985 *Wildcat Road Reroute*, BLM, Price, Utah

Mrstik, Jessica & Keith Montgomery

2005 *Cultural Resource Inventory of Division of Wildlife Resources BLM Treatment Plan, Carbon County, Utah*, Montgomery Archeological Consultants, Inc, Moab, Utah.

Senulis, John A.

2001a *Intensive Cultural Resource Survey and Inventory of the USA 03-301, USA 04-469, Utah 34-510, Utah 34-512 and Ritzakis 33-516 Well pads and Access Corridors in the Consumers Bench Area of River Gas Coal Methane Field*, SENCO-PHENIX Archeological Consultants, Price, Utah.

2001b *An Intensive Cultural Resource Survey and Inventory of the USA 03-301, Ritzakis 33-514 Well Pads and Access Corridors and the Wildcat Access Corridor in the Phillips Petroleum Coalbed Gas Methane Field*, SENCO-PHENIX Archeological Consultants, Price, Utah.

2002 *An Intensive Cultural Resource Survey and Inventory of the USA 33-515, 33-624, Price 32-625, Dallin 32-615, and Rowley 32-616 Well Pads and Access Corridors and a Revised Pipeline Corridor in the Phillips Petroleum Coalbed Methane Field*, SENCO-PHENIX Archeological Consultants, Price, Utah.

2006 *An Intensive Cultural Resource Survey and Inventory of the Wildcat Loadout Expansion Block Area*, SENCO-PHENIX Archeological Consultants, Price, Utah

IMACS SITE FORM

Part A - Administrative Data

INTERMOUNTAIN ANTIQUITIES COMPUTER SYSTEM

Form approved for use by:

BLM - Utah, Idaho, Wyoming, Nevada

Division of State History - Utah, Wyoming

USFS - Intermountain Region

NPS - Utah, Wyoming

4. State: Utah

5. Project: SPUT- 551

*6. Report No: U07SC0272

7. Site Name / Property Name:

8. Class ☐ Prehistoric ☒ Historic ☐ Paleontologic ☐ Ethnographic

9. Site Type: Trash Scatter

*10. Elevation: 6230 feet

*11. UTM Grid Zone: 12 506538 mE, 4388611 mN

*12. SE ¼ of SE ¼ of NW ¼ of SW ¼ Section: 33 T.13S, R.9E

*13. Meridian: SLC

*14. Map Reference: Standardville, Utah (1972)

15. Aerial Photo: Same

16. Location and Access: From Helper, Utah proceed south ca. 1.5 miles to the Wildcat Loadout (Consumer's Bench) road running west. Proceed west ca. 3.1 miles to the UP railroad tracks. Cross the tracks and turn south on the wildcat Loadout road. Proceed south ca. .45 miles to the end of the road. Walk west ca. 1,400 feet to the site on the north side of the intermittent wash.

*17. Land Owner: BLM

*18. Federal Administrative Units: Price River Field Office

*19. Location of Curated Materials: N/A

20. Site Description: The site is historic trash scatter with a preponderance of alcoholic beverage containers. There is some evidence of food preparation and the site may have been a short term hunting camp. The artifacts include glass and tin cans scattered over a 6-meter (12 feet) diameter area. Artifacts include 35+ steel 12 ounce beverage (beer) cans opened with a church key; 1-6 and 1-8 ounce sanitary cans opened with an opener; 3 sanitary lids; 4 punched open evaporated milk cans; 2 aerosol cans; a 12 ounce salt shaker and a rectangular pepper tin. Glass included 6-12 ounce beer bottles with "No Deposit, No Return," on the neck and "Not to be Refilled," on the base; 2 broken, brown whiskey bottles with "Jos E Seagram and Sons, LTD, Canada embossed on the base; a clear glass ketchup bottle with "57" embossed on the base of the neck and H-257 embossed on the base. All of the glass bases had the maker's mark of an "I" in a circle, which is the mark of the Owens Illinois Glass Company used since 1954. There were 3 12-gauge shotgun shell casings. There is little potential for further information recovery. The site is not considered eligible for the NRHP.

*21. Site Condition ☐ Excellent (A) ☐ Good (B) ☒ Fair (C) ☐ Poor (D)

*22. Impact Agent(s): erosion.

*23. National Register Status ☐ Significant (C) ☒ Non-Significant (D) ☐ Unevaluated (Z)

Justify: The site has no constructed features, structures or apparent associations; there is little potential for additional information. The site is a surficial trash scatter with no evidence of buried remains and a surface modified by erosion that has altered the original context. The historic context is mid Twentieth Century. Historic trash scatters are common in this area and in the state of Utah. There is no event (a) or person (b) that can be associated with the site so those criteria are not applicable. The site is a trash scatter with no planning associated with the deposition and lack of constructed features means the site is not eligible under the criterion for design /construction (c). The site was used intermittently and the waste products that remain have been identified and any remaining artifacts are not suitable to provide additional information important to history and the site is not eligible under criterion (d).

24. Photos: 42CB2620- 1-4, SENCO-PHENIX

25. Recorded by: John Senulis

*26. Survey Organization: SENCO-PHENIX

28. Survey Date: March 31, 2007

27. Assisting Crew Members: Jeanne Senulis

List of Attachments: ☐ Part B

☒ Part C

☐ Part E

☒ Topo Map

☒ Site Sketch

☐ Other

☒ Photos

☐ Artifact/Feature Sketch

*Encoded data items

☐ Continuation Sheets

Part A – Environmental Data

*29. Slope: 02 (Degrees) Aspect: 110 (Degrees) Site No: 42CB2620

*30. Distance to Permanent Water 48 x 100 meters

Type of Water Source ☐ Spring/Seep (A) ☒ Stream/River (B) ☐ Lake (C) ☐ Other (D)

Name of Water Source: Gordon Creek

*31. Geographic Unit: Mancos Shale Lowlands

*32. Topographic Location

PRIMARY LANDFORM

- | | |
|---|--|
| <input type="checkbox"/> Mountain Spine (A) | <input type="checkbox"/> Alluvial Fan (A) |
| <input type="checkbox"/> Hill (B) | <input type="checkbox"/> Alcove/shelter (B) |
| <input type="checkbox"/> Tableland/Mesa (C) | <input type="checkbox"/> Arroyo (C) |
| <input type="checkbox"/> Ridge (D) | <input type="checkbox"/> Basin (D) |
| <input type="checkbox"/> Valley (E) | <input type="checkbox"/> Cave (E) |
| <input checked="" type="checkbox"/> Plain (F) | <input type="checkbox"/> Cliff (F) |
| <input type="checkbox"/> Canyon (G) | <input type="checkbox"/> Delta (G) |
| <input type="checkbox"/> Island (H) | <input type="checkbox"/> Detached Monolith (H) |

SECONDARY LANDFORM

- | | | |
|--|---|--|
| <input type="checkbox"/> Dune (I) | <input type="checkbox"/> Slope (Q) | <input type="checkbox"/> Riser (Y) |
| <input type="checkbox"/> Floodplain (J) | <input checked="" type="checkbox"/> Terrace/Bench (R) | <input type="checkbox"/> Mult. Landforms (1) |
| <input type="checkbox"/> Ledge (K) | <input type="checkbox"/> Talus Slope (S) | <input type="checkbox"/> Bar (2) |
| <input type="checkbox"/> Mesa/Butte (L) | <input type="checkbox"/> Island (T) | <input type="checkbox"/> Lagoon (3) |
| <input type="checkbox"/> Playa (M) | <input type="checkbox"/> Outcrop (U) | <input type="checkbox"/> Ephemeral Wash (4) |
| <input type="checkbox"/> Port. Geo. (N) | <input type="checkbox"/> Spring Mound/Bog (V) | <input type="checkbox"/> Kipuka (5) |
| <input type="checkbox"/> Plain (O) | <input type="checkbox"/> Valley (W) | <input type="checkbox"/> Saddle/Pass (6) |
| <input type="checkbox"/> Ridge/Knoll (P) | <input type="checkbox"/> Cutbank (X) | <input type="checkbox"/> Graben (7) |

Describe: The site location is on a gently sloping bench above an intermittent branch of Gordon Creek.

*33. Onsite Depositional Context

- | | | | |
|---|--|--|--|
| <input type="checkbox"/> Fan (A) | <input type="checkbox"/> Outcrop (Q) | <input type="checkbox"/> Moraine (J) | <input type="checkbox"/> Desert Pavement (P) |
| <input type="checkbox"/> Talus (B) | <input type="checkbox"/> Extinct Lake (F) | <input type="checkbox"/> Flood Plain (K) | <input type="checkbox"/> Stream Bed (R) |
| <input type="checkbox"/> Dune (C) | <input type="checkbox"/> Extant Lake (G) | <input type="checkbox"/> Marsh (L) | <input type="checkbox"/> Aeolian (S) |
| <input type="checkbox"/> Stream Terrace (D) | <input checked="" type="checkbox"/> Alluvial Plain (H) | <input type="checkbox"/> Landslide/Slump (M) | <input type="checkbox"/> None (T) |
| <input type="checkbox"/> Playa (E) | <input type="checkbox"/> Colluvium (I) | <input type="checkbox"/> Delta (N) | <input type="checkbox"/> Residual (U) |

Description of Soil: Tan clay loam.

34. Vegetation

a. Life Zone

☐ Arctic-Alpine (A) ☐ Hudsonian (B) ☐ Canadian (C) ☐ Transitional (D) ☒ Upper Sonoran (E) ☐ Lower Sonoran (F)

b. Community Primary Onsite: Q Secondary Onsite: H Surrounding Site: Q

- | | | | |
|--------------------|-----------------------------|-----------------------|--------------------|
| Aspen (A) | Other/Mixed Conifer (G) | Grassland/Steppe (M) | Marsh/Swamp (S) |
| Spruce/Fir (B) | Pinyon-Juniper Woodland (H) | Desert Lake Shore (N) | Lake/Reservoir (T) |
| Douglas Fir (C) | Wet Meadow (I) | Shadscale Com (O) | Agricultural (U) |
| Alpine Tundra (D) | Dry Meadow (J) | Tall Sagebrush (P) | Blackbrush (V) |
| Ponderosa Pine (E) | Oak-Maple Shrub (K) | Low Sagebrush (Q) | Creosote Brush (Y) |
| Lodgepole Pine (F) | Riparian (L) | Barren (R) | |

Describe: The vegetation includes low mainly drought killed low sagebrush, shadscale, prickly pear with scattered juniper and unknown introduced grasses.

*35. Miscellaneous Text:

36. Comments/Continuations:

Part C – Historic Sites

Site No: 42CB2620

1. Site Type: Historic trash

2. Historic Theme(s): Recreation (RC)

CULTURAL AFFILIATION

DATING METHOD

CULTURAL AFFILIATION

DATING METHOD

3. Culture: European-American

General cross-dating

Describe: Cross-dating of temporally diagnostic artifacts

4. Oldest Date: 1950's

Recent Date: 1960's

How Determined: Cross-dating of temporally diagnostic artifacts

5. Site Dimensions: 6 m X 6 m Area: 36 sq m

6. Surface Collections Method ☒ None (A) ☐ Designed Sample (C)
☐ Grab Sample (B) ☐ Complete Collection (D)

Sampling Method: N/A

7. Estimated Depth of Cultural Fill ☒ Surface (A) ☐ 20-100 cm (C) ☐ Fill noted but unknown (E)
☐ 0-20 cm (B) ☐ 100 cm + (D) ☐ Depth suspected, but not tested (F)

How Estimated: Observation of soil (If tested, show location of site map)

8. Excavation Status ☐ Excavated (A) ☐ Tested (B) ☒ Unexcavated (C)

Testing Method: N/A

9. Summary of Artifacts and Debris

☒ Glass (GL) ☐ Bone (BO) ☐ Leather (LE) ☒ Ammunition (AM) ☐ Domestic Items (DI)
☒ Metal (ME) ☐ Ceramics (CS) ☐ Wire (WI) ☐ Wood (WD) ☐ Kitchen Utensils (KU)
☐ Nails (NC,NW) ☐ Fabric (FA) ☒ Tin Cans ☐ Rubber (RB) ☐ Car/Car Parts (CR)

Describe Artifacts include 35+ steel 12 ounce beverage (beer) cans opened with a church key; 1-6 and 1-8 ounce sanitary cans opened with an opener; 3 sanitary lids; 4 punched open evaporated milk cans; 2 aerosol cans; a 12 ounce salt shaker and a rectangular pepper tin. Glass included 6-12 ounce beer bottles with "No Deposit, No Return," on the neck and "Not to be Refilled," on the base; 2 broken, brown whiskey bottles with "Jos E Seagram and Sons, LTD, Canada embossed on the base; a clear glass ketchup bottle with "57" embossed on the base of the neck and H-257 embossed on the base. All of the glass bases had the maker's mark of an "I" in a circle, which is the mark of the Owens Illinois Glass Company used since 1954. There were 3 12-gauge shotgun shell casings.

10. Ceramic Artifacts:

Paste	Glaze/Slip	Decoration	Pattern	Vessel Form(s)	#
-------	------------	------------	---------	----------------	---

a. Estimated Number of Ceramic Trademarks:

Describe:

Part C – Historic Sites

Site No. 42CB2620

Glass:	#	Manufacture	Color	Function	Trademarks	Decoration
	1	ABS	clear	Ketchup bottle	See below	none
	30+	ABS	brown	bottles	see below	none

Describe: Glass included 6–12 ounce beer bottles with “No Deposit, No Return,” on the neck and “Not to be Refilled,” on the base; 2 broken, brown whiskey bottles with “Jos E Seagram and Sons, LTD, Canada” embossed on the base; a clear glass ketchup bottle with “57” embossed on the base of the neck and H-257 embossed on the base. All of the glass bases had the maker’s mark of an “I” in a circle, which is the mark of the Owens Illinois Glass Company used since 1954.

12. Maximum Density – #/sq m (glass and ceramics): 1/20

13. Tin Cans

Type	Opening	Size	Modified	Label/Mark	Function
Sanitary	various	6–12 oz.	N/A	N/A	various
Evaporated	punched	10–12 oz.	N/A	N/A	milk

Describe: 35+ steel 12 ounce beverage (beer) cans opened with a church key; 1–6 and 1–8 ounce sanitary cans opened with an opener; 3 sanitary lids; 4 punched open evaporated milk cans; 2 aerosol cans; a 12 ounce salt shaker and a rectangular pepper tin.

14. Landscape and Constructed Features (locate on site map)

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Trail/Road (TR) | <input type="checkbox"/> Dump (DU) | <input type="checkbox"/> Dam, Earthen (DA) | <input type="checkbox"/> Hearth/Campfire (HE) |
| <input type="checkbox"/> Tailings (MT, ML) | <input type="checkbox"/> Depression (DE) | <input type="checkbox"/> Ditch (DI) | <input type="checkbox"/> Quarry (QU) |
| <input type="checkbox"/> Rock Alignment (RA) | <input type="checkbox"/> Cemetery/Burial (CB) | <input type="checkbox"/> Inscriptions (IN) | <input type="checkbox"/> Other (OT) |

Describe:

15. Buildings and Structures (locate on site map)

#	Material	Type	#	Material	Type
---	----------	------	---	----------	------

Describe

16. Comments/Continuations –

Reference

Toulouse, Julian

1971 *Bottle Makers and Their Marks*, Thomas Nelson, Inc. New York.

IMACS ENCODING FORM

THESE

IMACS ENCODING FORM

To be completed for each site form.

For instructions and codes, see IMACS Users Guide.

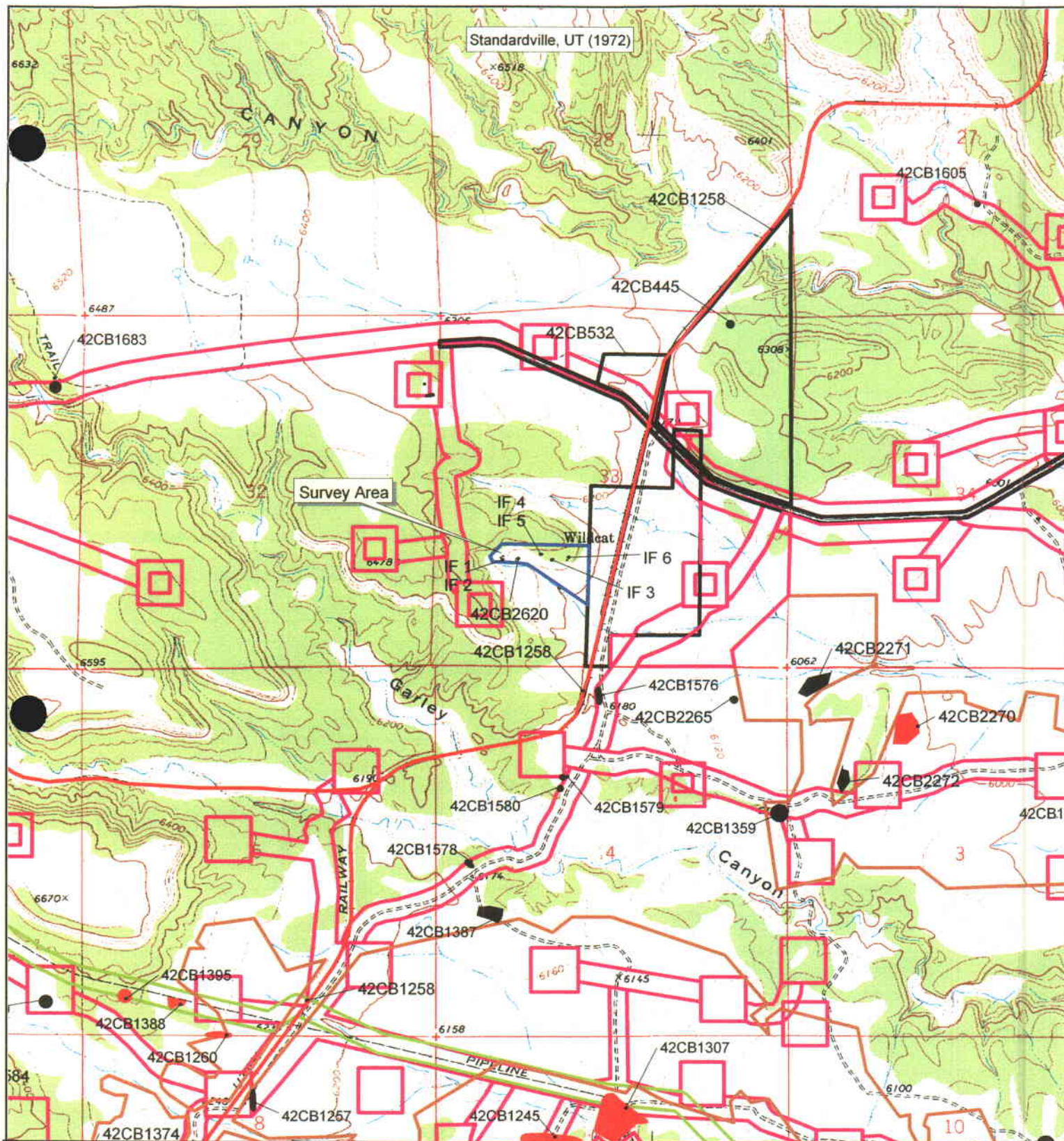
A

Topographic Location

Culture/Dating Method

22

U



SENCO-PHENIX



Scale 1:24,000
1" = 2,000'

- | | |
|--|-------------------|
| | Current Survey |
| | Previous Survey |
| | Montgomery Survey |
| | SWCA Survey |
| | Other Survey |
| | Eligible Sites |
| | Ineligible Sites |

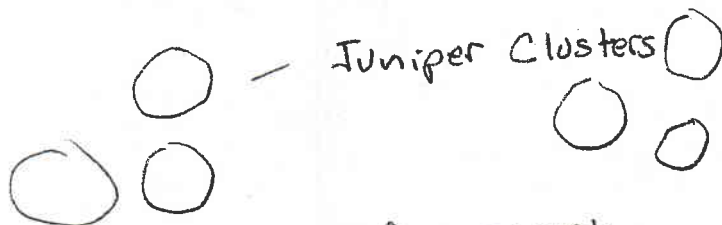
Material Storage Area
Wildcat Loadout
UtahAmerican Energy, Inc.
Section 33, T13S, R9E
Carbon County, Utah
March 2007
SPUT-551

Sketch location of 42CB2620



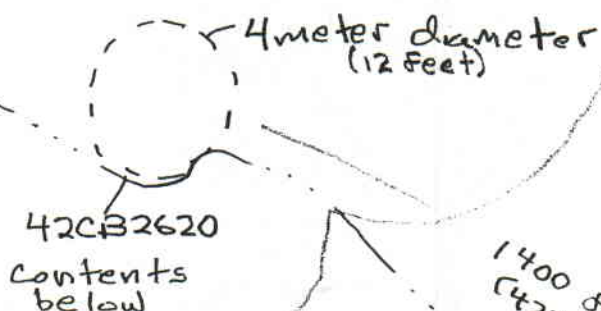
Area disturbed by
disk harrowing 20+ years BP

loadout
road



Juniper Clusters

Dead sagebrush
unknown grass/forb



1400 feet
(424 m)

Intermittent
Stream

road ends

Wildcat
loadout
construction
edge

Utah
Railway
(42CB1258)

No Scale

Site Content



SENCO-PHENIX

Tin Cans - 35+ sanitary ^{steel} 12oz. church key, 1 6oz & 1 8oz
3 12 gauge shotgun shell casings
sanitary cut around; 3 sanitary lids; 4 evaporated
milk, punched; 2 aerosol cans, 1 12oz. saltshaker
1 rectangular pepper
Glass - 6 12oz beer bottles "No Deposit, No Return" on neck
"Not to be refilled on base" ①; 2 broken brown whiskey
"①-Jos E Seagram & Sons LTD, Canada;" 1 Ketchup
clear glass 1.57" on neck base, H-257 ② on base
① = Owens Illinois Glass Co. since 1954
(Toulouse 403)

42CB2620



View East over Site



View South over Typical Debris Scatter

APPENDIX B-12A

BLM RIGHT-OF-WAY
AMENDED GRANT
FEBRUARY 5, 2006



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Price Field Office
125 South 600 West
Price, Utah 84501

<http://www.blm.gov/utah/price/>



Hand Delivered

2/5/07

Date

2800
UTU-48027 (mr)
(UT-070)

Andalex Resources, Inc.
PO Box 902
Price, Utah 84501

Re: Wildcat Loadout Extension

DECISION

:
:
:

Amendment Approved
Rental Determined

Right-of-way (ROW) UTU-48027 is hereby amended to authorize an extension of the existing Wildcat coal storage and loadout facility, in accordance with the enclosed Plan of Development (Exhibit A) and the map (Exhibit B). This amendment will encumber an additional 149.650 acres for a right-of-way total of 250 acres.

The amendment is legally described as:

T. 13 S., R. 09 E., Salt Lake Meridian, Carbon County, Utah
Section 33: SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$.

This amendment is granted under the authority of Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776 43 U.S.C. 1761). It is amended subject to all valid existing rights, the terms and conditions of the original grant approved January 12, 1982, and 43 CFR 2800. The rental for the amendment was figured to coincide with the original grant. The rental due through December 31, 2007, is \$17,820.83.

mk

The enclosed Plan of Development and the map are made a part of this amendment as terms and conditions. Additional Terms and Conditions to the right-of-way grant are attached as well. The term of this amendment to the right-of-way grant is being established to coincide with the original grant and expires on December 31, 2012.

The cost reimbursement provisions of 43 CFR 2805.16 and 2885.23, establish a cost recovery fee schedule for monitoring fees. It has been determined that your application falls under Category II. Under this category, you are required to pay a non-refundable monitoring fee in the amount of \$368.00 before we can issue this an authorization. The total payment required at this time is \$18,188.83.

The issuance of this ROW amendment constitutes a final decision by the Bureau of Land Management in this matter.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4, and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) or 43 CFR 2801.10 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay **must** also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

- (1) The relative harm to the parties if the stay is granted or denied;
- (2) The likelihood of the appellant's success on the merits;
- (3) The likelihood of immediate and irreparable harm if the stay is not granted; and
- (4) Whether the public interest favors granting the stay.

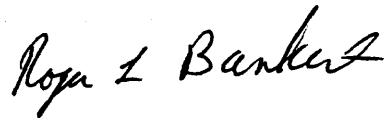
Should you appeal, you must still pay the rental requested. Failure to pay on time may result in termination of the right-of-way [see 43 CFR 2805.12(f) and 2806.13(c) or 2885.17(c)].

Please note, however, that under the regulations in 43 CFR Group 2800, this decision is effective even if an appeal is filed.

You have 30 days from receipt of this letter to submit the above-mentioned rental payment. Should the rental not be received within the time allowed, the application will be rejected.

If you have any questions, please contact Mike Robinson, Realty Specialist, at the above address or call (435) 636-3630.

Sincerely,

A handwritten signature in cursive script that reads "Roger Bankert".

Roger Bankert
Field Manager

4 Enclosures:

- 1 - Exhibit A Plan of Development
- 2 - Exhibit B Map
- 3 - Exhibit C Additional Terms & Conditions
- 4 - Appeals Information (Form #1842-1)

EXHIBIT A

Andalex Resources, Inc. Wildcat Loadout Expansion Project Plan of Development

Andalex Resources, Inc. (ARI) currently maintains a ROW (U-48027) for the Wildcat Loadout (Loadout) on 100.350 acres of land utilized as a coal preparation and loading facility for a number of mines located within the area. Of the 100.350 acres, approximately 12.5 acres are under lease to Utah Railway (U-52065) by the BLM). The Loadout site is permitted under Utah Division of Oil Gas and Mining (UDOGM). The facility has three truck dumps, a unit train loading track, and numerous conveyor belts, as well as numerous structures to facilitate reclaiming, crushing, storage and loadout of coal.

The Loadout facility is located on federal land in Carbon County, Utah (Plate 1). The current ROW is not large enough to facilitate total coal fine containment (primarily airborne dust from the coal piles). ARI needs to expand their facility site to create two new drainage ditches that would run into a new sediment pond for coal fine containment. The area is located in Section (Sec.) 33, Township (T.) 13 South (S.), Range (R.) 9 East (E.) of the Salt Lake Base and Meridian (SLB&M) (Plate 1). The Wildcat Loadout Expansion Project would necessitate expanding the ROW to include the E $\frac{1}{2}$ SW $\frac{1}{4}$ and the entire SE $\frac{1}{4}$ of Sec. 33, approximately 150 acres.

In the event the pond required decanting, a gas powered pump would be utilized. The pond would act as a retention basin to capture surface deposits of coal fines that currently could enter the existing drainages. The coal fines would be removed periodically or when the material reaches 60 percent of designed capacity. The fines would be hauled to an approved UDOGM refuse disposal site. The existing natural drainages serve as an undisturbed bypass to allow runoff from adjacent undisturbed land to bypass the pond.

It is important to note that a portion of the area is a recently reclaimed well pad location leased by ConocoPhillips Company. Roads within the project area would require no upgrading. No new fencing or culverts would be installed.

Construction of Storm Drainage – The Proposed Project would create two drainage ditches located inside of the 2 large natural washes (Plate 2). These drainage ditches would be approximately 36 inches deep with a 2:1 side slope (approximately 20 feet in width)(Figure 1). The southern most ditch would be approximately 1,930 feet (0.88 acres) in length and the northern most ditch would be approximately 2,067 feet (0.94 acres) in length. Construction of the ditches would require the utilization of a conventional trackhoe and road grader for a period of three to five days.

The two drainage ditches would meet at a central sediment pond. The approximate size of the pond would be 150 feet by 150 feet (0.52 acres) with an embankment approximately 10 feet in width and 11 feet in height. The pond may necessitate the use of a D-6 class crawler

tractor. The pond is designed to contain all runoff from the lands encompassed by the existing natural drainages (Figure 2). The pond would be constructed in the lowest quadrant of the ROW area whereby most loadout site disturbed area drainage would drain into the pond. The capacity of the pond would be well in excess of the 10-year, 24-hour precipitation event requirement.

One advantage of the pond is its proposed location adjacent to the roadway. This would greatly simplify sediment monitoring and cleanout. The culverted primary spillway would be constructed with an oil skimmer and built to pass the 10-year, 24-hour storm event. The emergency spillway would be lined with concrete or grouted rip-rap and have a bottom width of two feet; a freeboard depth of two feet and 2:1 side slopes and capable of handling a 25-year, 24-hour storm event. Riprap would be installed at the outlet of the open channel spillways to protect the earthen structures from erosional forces.

Topsoil Removal, Salvage and Stockpiling – Available soil over the area ranges from about 6 to 8 inches, of which an average soil layer of about 8 inches thick would be removed and stockpiled as topsoil. The upper 6 to 12 inches is the most suitable soil, however, the subsoils over much of the area support root growth to depths of about 48 inches. Topsoil would be salvaged with backhoes, trackhoes and/or front-end loaders and hauled by dump trucks to the designated topsoil storage area within the disturbed area. As much as 2,129 cubic yards of topsoil could be salvaged.

The topsoil storage area is proposed in the southeast corner of the facilities site near the sediment pond. The stockpile would be protected from erosion and sediment production by roughening the surface, revegetation, berms and silt fences. Subsoil materials would be used over the area for facilities site development and then retrieved for soil reconstruction during reclamation.

Stabilization, Maintenance and Operation Plan – Construction procedures would be consistent with those described within the Utah Nonpoint Source Best Management Plan for Hydrologic Modification. Where runoff and drainage controls would be required, they would be constructed to BLM standards. The hydrologic regime would be protected by the installation and implementation of protection measures at all proposed drainage modifications.

Maintenance would include the periodic cleaning of the pond and drainage control ditches in order to maintain their function. Clean out material would be disposed of off-site in an approved solid waste disposal facility, such as East Carbon Development Corporation (approximately 30 miles southwest of the surface facility). A Spill Prevention Control and Countermeasure Plan (SPCC Plan) has been developed to protect the undisturbed drainages from accidental spills of oil or other petroleum products within the disturbed area. This plan would be available for review at the loadout site.

In the event of spills of petroleum-based products during the construction of the PA, procedures outlined in the SPCC Plan would be followed. The BLM, as well as the Utah

Department of Environmental Quality, would be notified if the release meets the definition of a hazardous waste as defined in 40 CFR 261.

To maintain the cultural, historical and paleontological resource integrity of the area, construction crews and staff would be provided with instructional materials regarding the identification, value, legal protection and treatment of these resources. If any cultural, archeological or paleontological resources are discovered during construction or any operations associated with the railroad, conveyor or surface loadout facilities, all activities would cease at the area of the manifestation. The authorized agency would then be contacted to evaluate the importance and potential of the site. Mitigation measures would, at that time, be made for the value of the resource site. Construction and/or maintenance crews would avoid the site until the resource potential has been determined.

Potential measures to help improve air quality for construction activities include proper maintenance of the construction equipment and limited travel on the construction ROW and dirt access roads. Dust generation from disturbed areas would be reduced through interim watering of active construction areas. An enzyme armor coating on the access road would minimize dust generated by traffic during construction or eliminating it all together. Final reclamation, which included revegetation of all disturbed areas, would eliminate further impacts.

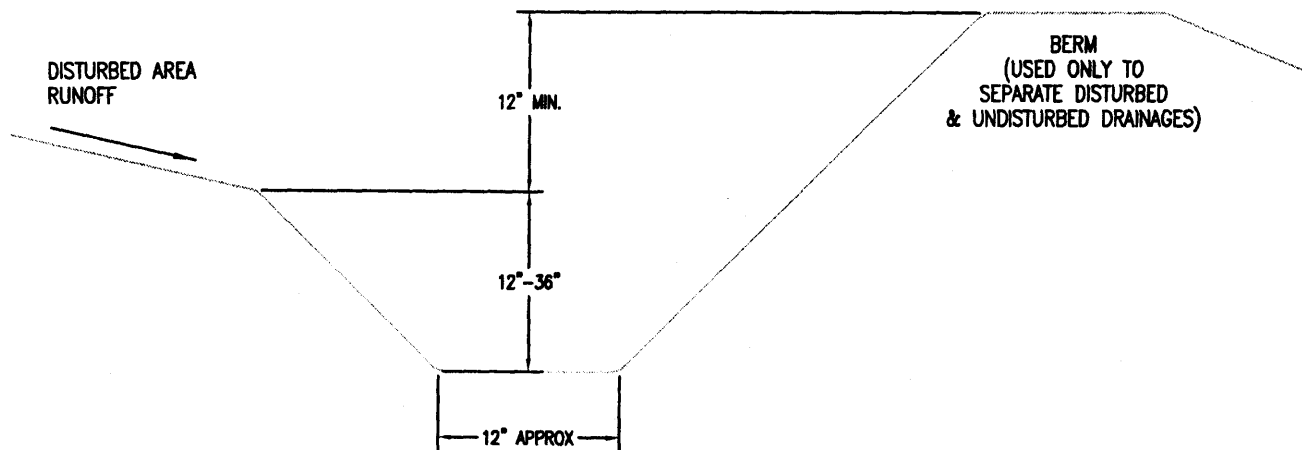
Vegetation removal necessitated by the PA would be confined to the ROW. Vegetation removed would be set-aside during construction activities, and/or left in place upon completion of construction where possible. Reclamation would be completed as stated in the Wildcat M&RP.

Prior to construction and operation of the PA, an awareness and appreciation of wildlife would be taught to all employees associated with the project. All activities associated with the PA development would be coordinated to avoid optimal habitat use periods and areas for all wildlife species. The May 2006 raptor survey conducted by the Utah Division of Wildlife Resources did not find any active nests within 0.5 mile of the proposed project area. However, if active/occupied raptor nests are located within 0.5 mile of any portion of the project area, construction would not begin within that area during the period of February 1 to July 15.

Abandonment and Reclamation The existing Wildcat Loadout Facility would be reclaimed according to the M&RP.

EXHIBIT B

DISTURBED FLOW DITCH TYPICAL



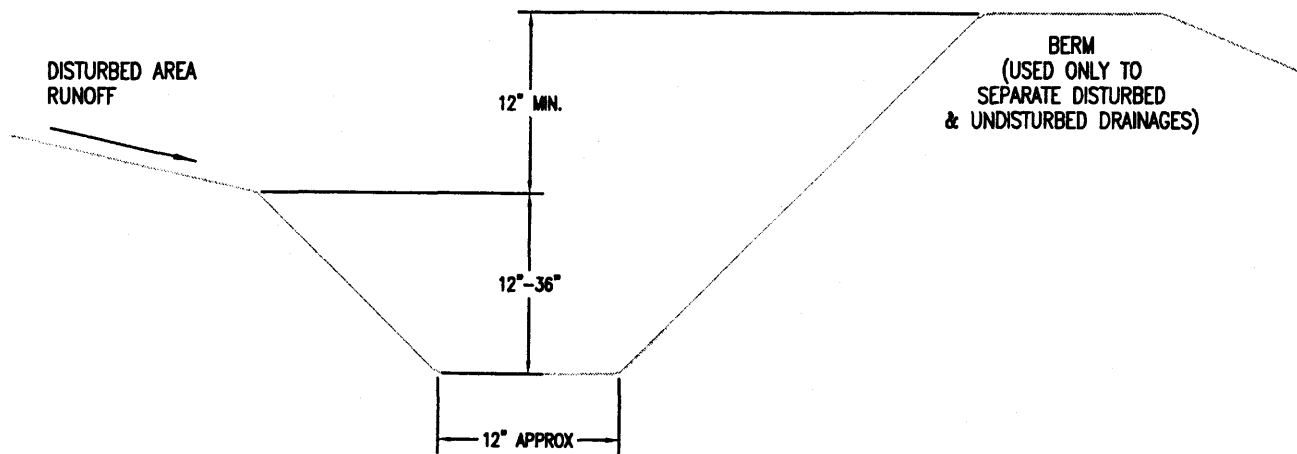
TYPICAL SECTION

NOTE:

DITCHES ARE TYPICALLY UNLINED. WHERE FLOW VELOCITIES EXCEED 5 fps, DITCHES ARE LINED WITH RIP-RAP FOR EROSION PROTECTION.

FIGURE 1

DISTURBED FLOW DITCH
TYPICAL

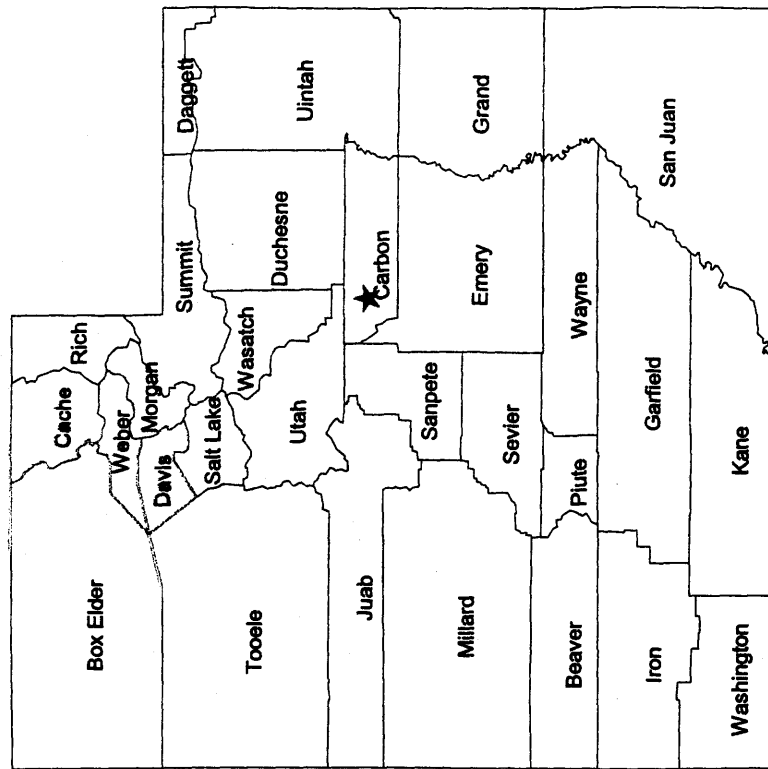
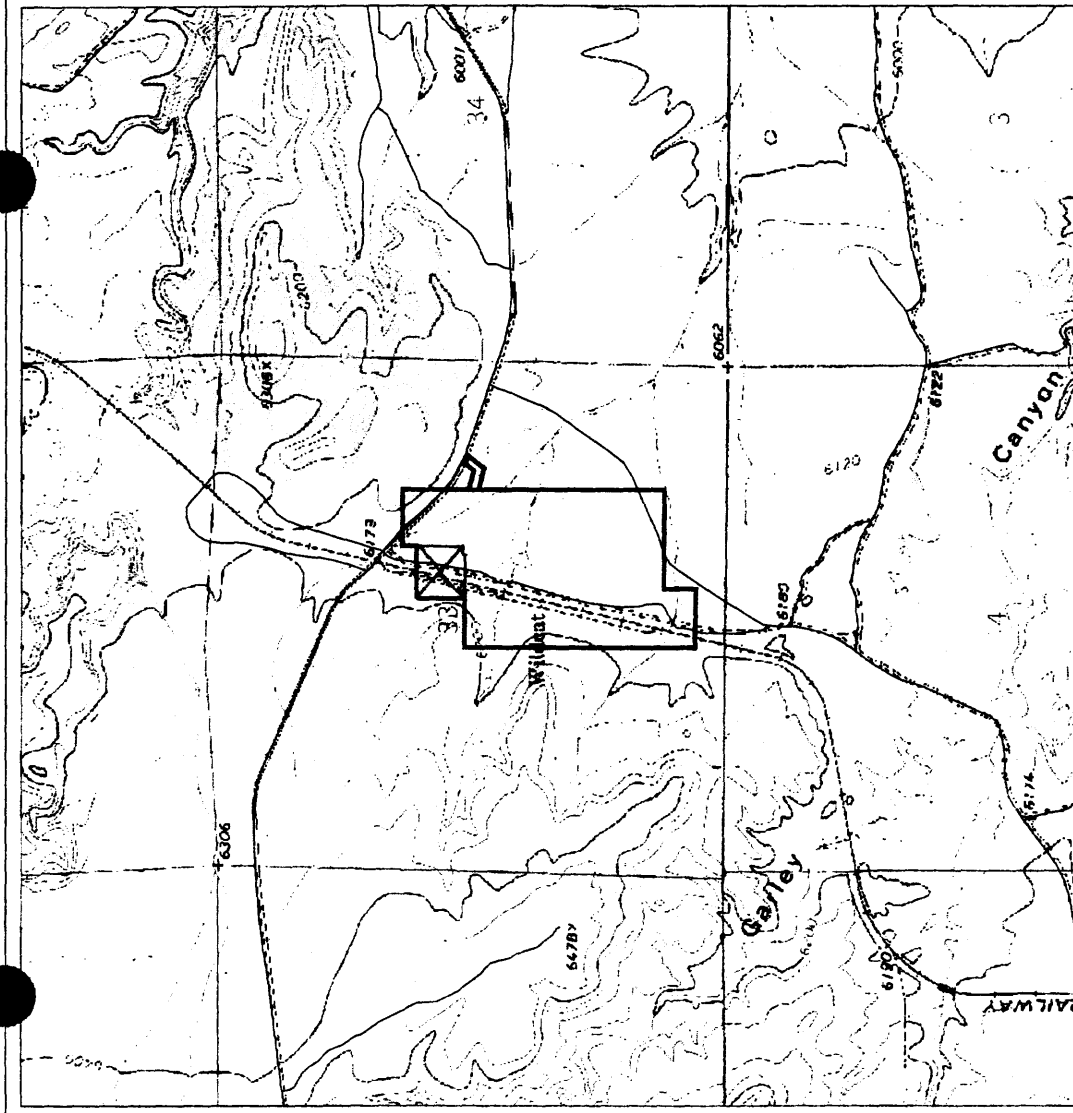


TYPICAL SECTION

NOTE:

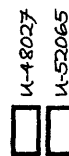
DITCHES ARE TYPICALLY UNLINED. WHERE FLOW VELOCITIES EXCEED 5 fps, DITCHES ARE LINED WITH RIP-RAP FOR EROSION PROTECTION.

FIGURE 1



★ Project Area

LEGEND



Section 33
Township 13 South,
Range 9 East
Salt Lake Base & Meridian



Environmental & Engineering Consulting

31 North Main Street
Helper, Utah 84526
(435) 472-3814
Fax- (435) 472-8780
knash@preciscom.net

Proposed Wildcat Loadout
Expansion Project

General Location Area

Created By: Katie Nash
Date: October 11, 2006

Scale 1" = 2,000'



Created For

ANDALEX RESOURCES, INC.

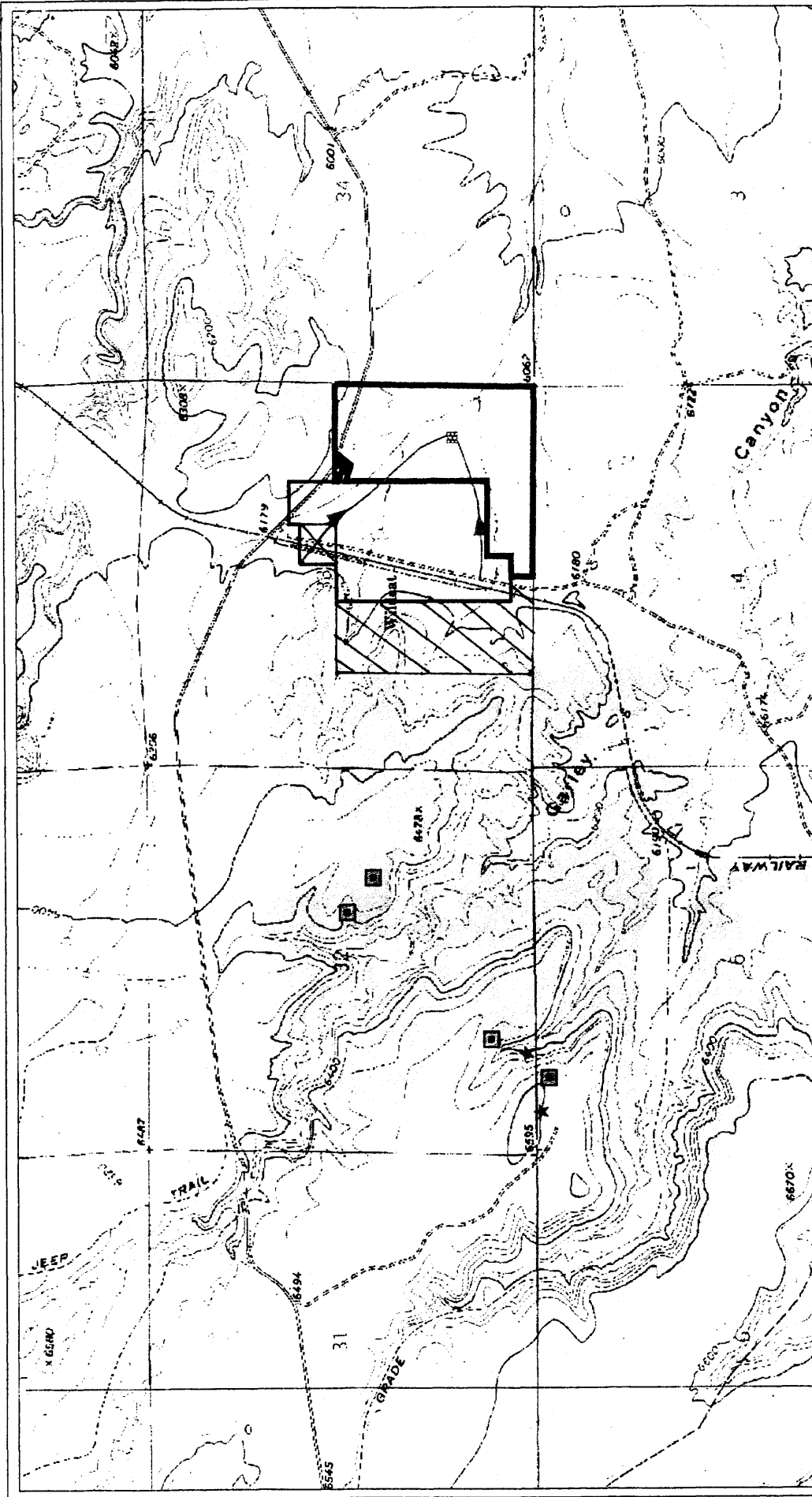
P.O. Box 902
Price, Utah 84501

DISCLAIMER:
EIS is not responsible for any errors or omissions.
All topographic maps were downloaded from:
<http://www.waterrights.utah.gov>
EIS 2006

PLATE

1

X = Excluded



LEGEND

Additional ROW Requested

Proposed Sediment Pond

Proposed Drainage Ditch

U-48027

U-52065

Golden Eagle

Red-tailed Hawk

Environmental

Industrial

Services

Environmental & Engineering Consulting

31 North Main Street

Helper, Utah 84526

(435) 472-3814

Fax- (435) 472-8780

knash@preciscom.net

Section 33

Township 13 South,

Range 9 East,

Salt Lake Base & Meridian

Proposed Wildcat Loadout

Expansion Project

2006 Raptor Survey

Created For:

ANDALEX RESOURCES, INC.

P.O. Box 902

Price, Utah 84501

Environmental

Industrial

Services

Environmental & Engineering Consulting

Created By: Katie Nash

Date: October 11, 2006

Scale 1" = 1,000'

DISCLAIMER:
ELS is not responsible for any errors or omissions.
All topographic maps were downloaded from:
<http://www.waterrights.utah.gov>
ELS 2006

PLATE

3

X = Excluded

1/1 = Included

Local = T.13S., R.9E., S33: SE 1/4 SW 1/4 NE 1/4, E 1/2 SW 1/4, SE 1/4.

Exhibit C

Additional Terms and Conditions

Wildcat Loadout Extension, UTU-48027

Andalex Resources, Inc.

T. 13 S., R. 09 E., Salt Lake Meridian, Carbon County, Utah

Section 33: SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$.

Stipulations

- a. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the plan of development which was approved and made part of this grant by this amendment. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way amendment, including all stipulations, map and approved plan of development, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.
- b. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.
- c. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the holder shall obtain from the authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer. Emergency use of pesticides shall be approved in writing by the authorized officer prior to such use.
- d. The holder shall be responsible for weed control on disturbed areas within the limits of the right-of-way. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations).
- e. The holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the authorized officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the holder shall be responsible for the survey cost.

- f. The holder shall comply with all Federal, State, and local regulations whether or not specifically mentioned within this grant.
- g. The holder of this right-of-way grant or the holder's successor in interest shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.
- h. The holder shall comply with the construction practices and mitigating measures established by 33 CFR 323.4, which sets forth the parameters of the "nationwide permit" required by Section 404 of the Clean Water Act. If the proposed action exceeds the parameters of the nationwide permit, the holder shall obtain an individual permit from the appropriate office of the Army Corps of Engineers and provide the authorized officer with a copy of same. Failure to comply with this requirement shall be cause for suspension or termination of this right-of-way grant.
- i. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil shall be deemed too wet to adequately support construction equipment.
- j. The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.
- k. The holder shall permit free and unrestricted public access to and upon the right-of-way for all lawful purposes except for those specific areas designated as restricted by the authorized officer to protect the public, wildlife, livestock or facilities constructed within the right-of-way.
- l. All above-ground structures, production equipment, tanks, transformers, insulators, not subject to safety requirements shall be painted to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors." The color selected is Shale Green (5Y 4/2).
- m. The holder will comply with all pertinent state and federal permitting requirements.
- n. The holder(s) shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
- o. The holder shall comply with all federal, state, and local laws and regulations pertaining to disposal of human and solid wastes.
- p. Hazardous substances specifically listed as a hazardous waste under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended 42 U.S.C. 9601 et seq., and the regulations issued under CERCLA, or demonstrating a character of a hazardous waste (see 40 CFR 261) will not be stored or disposed of on the right-of-way.
- q. A minimum of 6 inches of topsoil will be stripped from the location (including areas of cut, fill, and/or subsoil storage areas) and stockpiled for future reclamation.

- b. Suitable topsoil material removed in conjunction with clearing and stripping shall be conserved in stockpiles within the right-of-way.
- r. For the protection of livestock and wildlife, the entire right-of-way south of Consumers Road shall be fenced. Fencing shall be in accordance with BLM specifications.
- s. Topsoil stockpiled for more than three months will be protected from erosion by reducing piles to less than three feet in height and by seeding and possibly mulching. Topsoil stockpiles shall be seeded by the first appropriate period (late autumn or early spring) after their construction.
- t. Restoration and seeding should be done either late in the autumn (September 15 to November 15, before freeze up) or as early as possible the following spring to take advantage of available ground moisture. Seeding will be repeated until a satisfactory stand is established as determined by the Authorized Officer. If the seed is broadcast, twice the proposed drilled rate will be used.
- u. All disturbed areas shall be recontoured by grading to return the site to approximate the original contour of the ground by forming natural, rounded slopes.
- v. The surface soil material will be plowed to form longitudinal depressions 12-18 inches deep and the entire reclamation area will be uniformly covered with the depressions constructed perpendicular to the natural flow of water and/or prevailing wind. Either the above method or some comparable technique (i.e. snow fencing) will be used to roughen the surface and help increase soil moisture retention.
- w. Waterbars will be constructed on all disturbed areas to: (1) simulate the imaginary contour lines of the slope with a grade of one or two percent; (2) drain away from the disturbed area; and (3) begin and end in undisturbed vegetation or soil.
- x. All equipment and miscellaneous trash must be removed from the location prior to final reclamation operations.
- y. The holder shall seed all disturbed areas with an appropriate seed mixture(s) for the area. There shall be no primary or secondary noxious weed seed in the seed mixture. Seed shall be tested and the viability testing of seed shall be done in accordance with State law(s) and within two months prior to purchase. Commercial seed shall be either certified or registered seed. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection by the authorized officer.
- z. Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area. (Smaller/heavier seeds have a tendency to drop to the bottom of the drill and are planted first. The holder shall take appropriate measures to ensure this does not occur.) Where drilling is not possible, seed shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of the first growing season after seeding. The authorized officer is to be notified a minimum of three days prior to seeding of the project.
- aa. The holder shall be responsible for the prevention and suppression of fires on public lands caused by its employees, contractors, or subcontractors. During conditions of extreme fire danger, surface use operations may be either limited or suspended in specific areas, or additional measures may be required by the authorized officer.

IN WITNESS WHEREOF, The undersigned agrees to the terms and conditions of this right-of-way grant or permit.

J. Bruce Heller
(Signature of Holder)

DESIGNER
(Title)

1/26/07
(Date)

Robert Barkman
(Signature of BLM Authorized Officer)

Field Manager, Price Field Office
(Title)

1/29/07
(Effective Date of Grant)



**United States Department of the Interior
BUREAU OF LAND MANAGEMENT**

Price Field Office
125 South 600 West
Price, Utah 84501
<http://www.blm.gov/utah/price/>



MAR 23 2007

In Reply Refer to:
2800
UTU-48027
(UT-070)

CERTIFIED MAIL NO. 7006 0100 0001 0304 9212
RETURN RECEIPT REQUESTED

Dave Shaver
Andalex Resources, Inc.
PO Box 902
Price, Utah 84501

Re: Wildcat Loadout Extension

Non-Substantial Deviation Approved, Right-of-Way Grant Modified, Rental Reviewed and
Proposed Material Storage Area Determined.

We are in receipt of your letter dated March 12, 2007, regarding the proposed changes to the Wildcat Extension amendment dated February 5, 2007. The proposal is in the SE $\frac{1}{4}$, Section 33, T. 13 S., R. 09 E., Salt Lake Meridian, Carbon County, Utah.

The letter submitted detailing the changes to the original application is not considerably different from the approved amendment. The three ponds detailed and the drainages attached thereof will not change the Environmental document that originally analyzed this project. Therefore, it has been determined to be a non-substantial deviation.

In discussions with your company it was found that there was confusion as to what the actual legal description of the right-of-way was as well as the actual boundaries of the ROW on the ground. We reviewed the file and found that the acreages were in error. The Legal description for this file should read:

T. 13 S., R. 9 E. Salt Lake Meridian, Carbon County, Utah
Section 33: NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$.

As such the acreage for this ROW is 270 acres. See map enclosed for the details of your original ROW and the newest amendment. Please note these changes on your records.

The original ROW amendment charged you \$17,820.83 for rental on 250 acres. Upon further review, it was found that the BLM had overbilled you for rent. The enclosed spreadsheet details this error. We will be issuing you a refund in the amount of \$5,233.68 in the coming weeks.

We are also in receipt of your letter dated March 21, 2007 concerning your proposal to develop a material and equipment storage area for your operations. As stated in the original grant's Terms and Conditions:

"9. If at any time hereafter the holder wishes to reconstruct, remodel or relocate any portion of the right-of-way hereby granted, or any of the improvements thereon, the prior written approval of the Authorized Officer must be obtained. No such approval will be given unless the request is fully justified by the holder and is authorized by law. Where necessary, the holder shall make application under appropriate regulations."

Since this proposal was not on the original application for amendment, a new application for amendment will be required even though it is on your present right-of-way. This new application will need to contain an SF-299, a Plan of Development and a 1:2000 scale map depicting this proposal. The BLM will then be able to further analyze the proposal and any environmental documents needed.

If you have any questions, please contact Mike Robinson, Realty Specialist, at the above address or call (435) 636-3630.

Sincerely,



Roger Bankert
Field Manager

Enclosures:

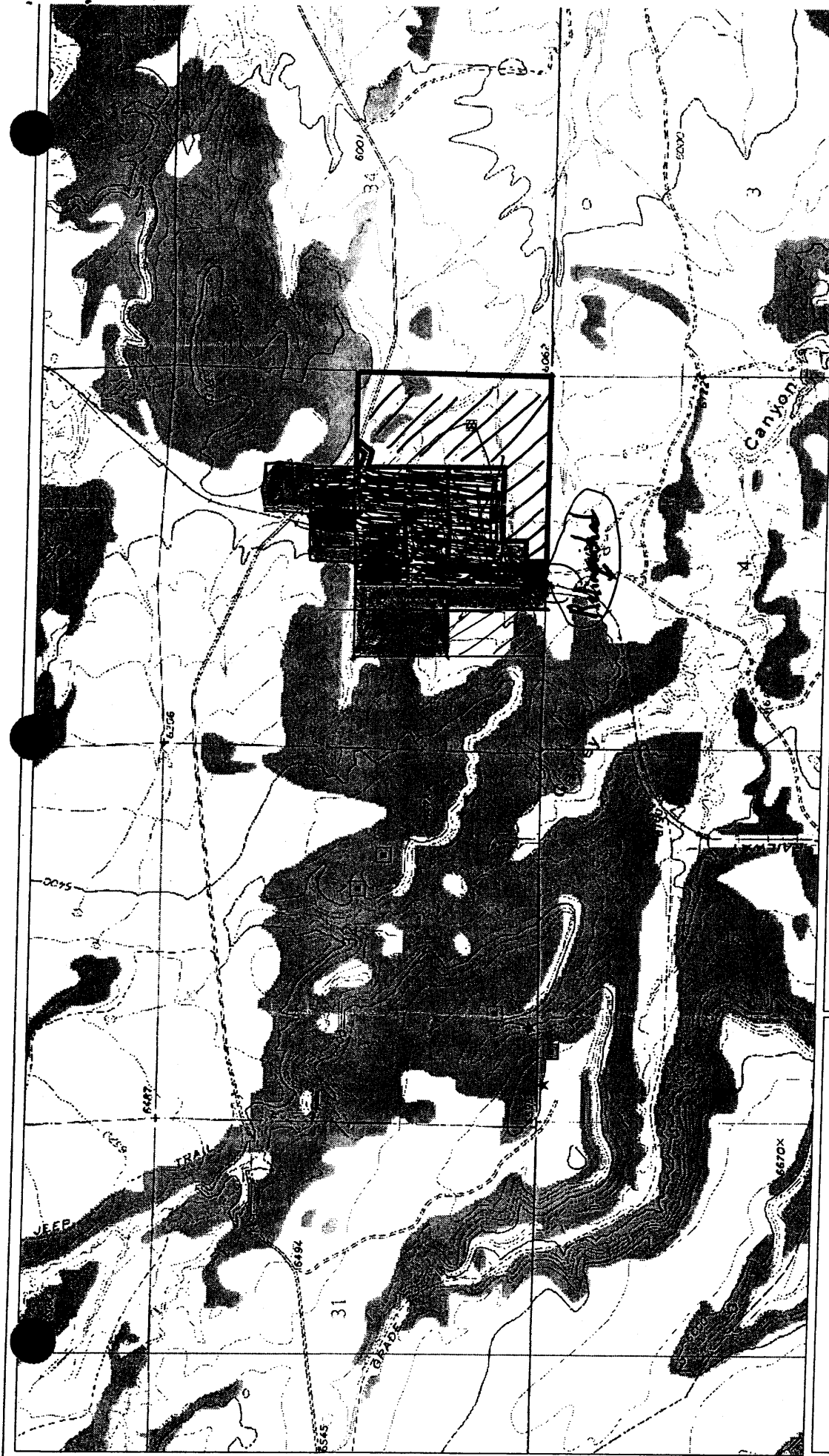
- 1 - Rental Calculation
- 2 - Map

Wildcant Loadout Rentals

Year	2007		
Date Paid	Paid	2nd Payment for Amendment	Total Paid
12/21/2006	\$8,584.00	\$17,820.83	\$26,404.83

Acres	Per Acre	Prorated from February approval	Due
270	\$85.54	0.92	\$21,171.15

Balance
\$5,233.68



LEGEND

- Additional ROW Requested
- Proposed Sediment Pond
- Proposed Drainage Ditch
- U-48027
- U-52065
- Golden Eagle
- Red-tailed Hawk

**Environmental
Industrial
Services**

Environmental & Engineering Consulting

31 North Main Street
 Helper, Utah 84526
 (435) 472-3814
 Fax- (435) 472-8780
 kwash@preciscom.net

Section 33
 Township 13 South,
 Range 9 East,
 Salt Lake Base & Meridian



Proposed Wildcat Loadout
 Expansion Project
 2006 Raptor Survey

Created By: Katie Nash
 Date: October 11, 2006

Scale 1" = 1,000'

Created For:

ANDALEX RESOURCES, INC.

P.O. Box 902
 Price, Utah 84501

**PLATE
3**

DISCLAIMER:
 EIS is not responsible for any errors or omissions.
 All topographic maps were downloaded from:
<http://www.waterrights.utah.gov>
 EIS 2006

Shaded is Original - New Amendment

APPENDIX B, PART B
VIOLATION INFORMATION

VIOLATION INFORMATION

Information updated to April 2007

Name of Operation			Identifying number for operation				Federal or State Permit Number	MSHA ID Number
UMCO			74645				PA 63921301	3608375
Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Abatement Action	Appeal Y or N
9/1/2004	426787	DMRM		63921301	86.13	No resolution		N
9/3/2004	426786	DMRM		63921301	89.142a(b)	No resolution		N
9/20/2004	427936	DMRM		63921301	89.142a(b)	No resolution		N
1/4/2005	445603	Air Quality		63921301	25.127.25	ADM. Close Out		N
1/13/2005	445603	Air Quality		63921301	25.127.25	ADM Close Out		N
3/18/2005	445603	Air Quality		63921301	25.127.25	ADM Close Out		N
6/10/2005	466153	DEP		63921301	25.89.21	No resolution		N
7/15/2005	448412	DEP		63921301	25.89.68	Abated		N
7/15/2005	448413	DEP		63921301	25.89.83(a)	Abated		N
10/10/2006	499479	PADEP		63921301	89.142a(f)	No resolution		Y

Name of Operation			Identifying number for operation			Federal or State Permit Number	MSHA ID Number
Maple Creek			4244			63723707	36-00970
Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Appeal Y or N
5/7/2004	394440	MCM		63841302	89.142A.F.1	Abated	N
5/12/2004	394880	MCM		63841302	89.142A.F.1	No resolution	N
5/13/2004	395344	MCM		63841302	89.142A.F.1	No resolution	N
5/13/2004	395345	MCM		63841302	89.142A.F.1V	No resolution	N
5/13/2004	395346	MCM		63841302	89.142A.E	Abated	N
5/7/2004	394440	MCM		63841302	89.142A.F.1	Abated	N
7/7/2004	401714	MCM		63841302	89.142A.F.1	No resolution	N
7/30/2004	421806	MCM		63841302	SMCRA.18.6	Abated	N
8/26/2004	425804	MCM		63841302	89.142A.F.1	No resolution	N
8/13/2004	426148	MCM		63723707	86.13	Abated	N
9/8/2004	427302	MCM		63723707	90.102	Abated	N
9/10/2004	427564	MCM		63723707	90.102	Abated	N
9/13/2004	427565	MCM		63723707	90.102	Abated	N
9/14/2004	427566	MCM		63723707	90.102	Abated	N
9/14/2004	427567	MCM		63723707	90.112	Abated	N
10/19/2004	432068	MCM		63723707	90.102	Abated	N
7/29/2005	469866	DEP		63723707	89.142a(b)(1)(iii)	No Resolution	N
12/1/2005	478486	PADEP		63841302	89.145a(b)	No Resolution	N
12/1/2005	478487	PADEP		63841302	89.145a(f)(1)(v)	No Resolution	N
12/1/2005	478488	PADEP		63841302	89.145a(b)	No Resolution	N
1/9/2006	480660	PADEP		63841302	1396.18(f)	Abated	N
6/12/2006	491619	PADEP		6381302	89.142a(e)	No Resolution	Y

Name of Operation		Identifying number for operation			Federal or State Permit Number	MSHA ID Number		
PENNAMERICAN COAL LP		93081			32951301	36-00970		
Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Abatement Action	Appeal Y or N

Kim Betcher

[illegible]

Name of Operation		Identifying number for operation	Federal or State Permit Number	MSHA ID Number
Energy Resources, Inc.		470	License # 1465	360 269 5

Charlie Shestak

Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Abatement Action	Appeal Y or N
5/11/2004	143258	PaDEP	ERI	24010101	87.147	Abated	Corrected	N
8/26/2004	167665	PaDEP	ERI	24010101	87.140	Abated	Corrected	N
8/30/2004	168590	PaDEP	ERI	24970102	87.147	Abated	Corrected	N
7/6/2004	147120	PaDEP	ERI	33901602	89.52	Abated	Corrected	N
7/31/2006	211989	PaDEP	ERI	17841607	86.152	Abated	Corrected	N
4/11/2006	486936	PaDEP	ERI	17930120	87.157	Abated	Corrected	N

Name of Operation	Identifying number for operation	Federal or State Permit Number	MSHA ID Number
Belmont Coal Company		D-0241/D-1020	33-04397/33-03048

David Bartsch

Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Abatement Action	Appeal
2/24/2004	24541	DMR	Mine	D-0241	Gullies exist in regraded	Terminated	regraded	Y or N

David Bartsch

Name of Operation		Identifying number for operation		Federal or State Permit Number	MSHA ID Number			
The Ohio Valley Coal Co.		Powhatan No. 6 Mine		State – D-0360	33-01159			
Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Abatement Action	Appeal Y or N
8/2/2004	19662	DMRM	Mine	D-0360	Failure to maintain sediment control	Terminated	Cleaned Ditch	N
5/23/2006	19656	DMRM	Mine	D-0360	Failure to maintain the perimeter of diversion ditch	Terminated	Cleaned Ditch	N
11/30/2006	28473	DMRM	Mine	D-0360	Undirected Drainage	Terminated	Cleaned Ditch	N
11/30/2006	28484	DMRM	Mine	D-0360	Coal Blocking Diversion Ditch	Terminated	Cleaned Ditch	N

David Bartsch

Name of Operation			Identifying number for operation					Federal or State Permit Number	MSHA ID Number
American Energy Corp								D-0425	33-01070
Date Issued	Violation Number	Name of Issuing Agency	Person Issued To	Permit Number	Brief Description of Violation	Status (Abated, Term. etc.)	Abatement Action	Appeal Y or N	
1/25/2005	21807	ODNR		D-0425	subsidized residnet ran out of water	Terminated	filled tank with water	N	
4/27/2005	19696	ODNR		D-0425	Coal located outside stockpile area	Terminated	cleaned coal	N	
4/29/2005	19695	ODNR		D-0425	Maintenance on pond 018	Terminated	cleaned out pond	N	
4/27/2005	19697	ODNR		D-0425	drainage from property not entering sumps	Terminated	construct sumps	N	
10/3/2005	21871	ODNR		D-0425	Failure to sub specific repairs (landowner)	Active		N	
6/15/2006	21860	ODNR		D-1159	Segregate Prim Farmland soils	Active	Waiting on ODNR, All information submitted	N	
Aug-05	CO-1726	ODNR		D-0425	Uncontrolled discharge (Slurry)	Avtive	Will submit revised Plan Mid Month	N	

The following companies either did not have any violations in the last three years or do not have permits.

Oklahoma Coal Company

KenAmerican Resources, Inc.

Onieda Coal, Inc.

MonValley Transportation Center, Inc.

Mill Creek Mining Co.

Pinski Corp

American Compliance Coal Inc.

Coal Resources Inc.

PA Transloading, Inc.

West Virginia Resources Inc.

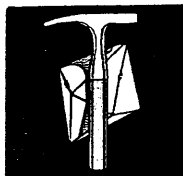
American Coal Sales Co.

Hocking Valley Resources Co..

APPENDIX D
(SUPPLEMENT)

SOILS REPORT
JAMES NYENHUIS

**SOIL SURVEY FOR THE
TWELVE-ACRE EXPANSION AREA
AT THE
WILDCAT LOADOUT**



INCORPORATED
MAY 17 2006
Div. of Oil, Gas & Mining

Prepared by

MT. NEBO SCIENTIFIC, INC.

330 East 400 South, Suite 6
Springville, Utah 84663
(801) 489-6937

James H. Nyenhuis
Certified Professional Soil Scientist
(ARCPACS #2753)

for

ANDALEX RESOURCES, INC

P.O. Box 902
Price, UT 84501

July 2003



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MAY 17 2003

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INTRODUCTION

Andalex Resources needs to expand their coal storage area at the Wildcat Loadout facility located just south of Consumers Road about four miles west of Helper in Carbon County. The site is located in a portion of Section 33, T.14S., R.9E. as shown on the Standardville 7.5 minute USGS topographic quadrangle. A detailed Order 1-2 soil survey was conducted in March 2003 on approximately 12 acres of land immediately adjacent to the east of the current coal storage piles. A one acre site within the current Wildcat permit area but not part of the original to-be-affected disturbance area was previously mapped, sampled, and reported in April, 2003. The current report includes the one acre but expands to include a total of approximately 12 acres all located immediately adjacent to the east of the current coal piles.

Andalex wants to utilize the one acre site for coal storage immediately and the additional eleven acres at a later time. The identification and proper management of topsoil resources on the study area is essential for the success of future reclamation and the achievement of the post-disturbance land use. The information presented in this report is designed to aid in formulating a practical and successful reclamation plan.

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METHODS

Standard soil survey methods were used throughout the project. Andalex provided a site photo-map to Patrick Collins. Dr. Collins conducted field work at the site on March 5 and designated three locations as representative of the soil on the one acre study area. A backhoe pit was dug at each of the three sites. Dr. Collins examined the three soil profiles and sampled two of them, WC1 and WC2. Samples were subsequently delivered to Brigham Young University's soil testing laboratory for standard analysis as described in the "Guidelines for Management of Topsoil and Overburden" (State of Utah, 2002). Dr. Collins also investigated the extent of coal fines deposition on the one acre site by means of numerous spade holes dug on a grid transect basis.

The site was then visited on March 11 by Patrick Collins and Jim Nyenhuis, a Certified Professional Soil Scientist. Dr. Collins described his sampling rationale and Mr. Nyenhuis concurred that it was appropriate for the Hernandez soil. The next day, March 12, seven additional backhoe pits were sited and dug on the larger twelve acre study area. Ms. Priscilla Burton (UDOGM soil scientist and reclamation specialist) was present for the day and observed all ten backhoe pits and assisted in the description and sampling of several soil profiles. She observed all three pits on the primary one acre study area. Mr. Nyenhuis concluded the soils description and sampling of the larger area on the following day, March 13, 2003.

The twenty-three soil samples collected from the additional seven soil backhoe pits were delivered to Colorado State University's Soil Testing Laboratory for analysis. The following parameters

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were analyzed: pH; electrical conductivity (EC); saturation percent; percent calcium carbonate equivalent; organic matter percent; texture (sand, silt, clay, and very fine sand as a part of total sand); meq/L of Ca, Mg, Na, and K; SAR; and AB-DTPA extractable nitrate nitrogen (NO₃-N), P, K, Zn, Fe, Mn, and Cu.

RESULTS

Ten backhoe pits were dug in representative locations across the 12 acre study area (see "Soil Survey Map" included with this report). Soils were described at each of the pits, and eight of the ten pits were sampled for laboratory analysis. Sample sites WC1 and WC2 were sampled as part of the one acre study, and samples sites WC4, WC6, WC7, WC8, WC9, and WC10 were sampled as part of the larger 12 acre study. The soil laboratory data is attached to this report. Three soil map units were delineated across the 12 acre study area: (A) Hernandez loam, 1 to 6 percent slopes, (B) Haverdad loam, 2 to 8% slopes, and (C) Strych Variant, shallow to moderately deep, 2 to 6% slopes.

Average elevation of the study area is about 6,100 to 6,155 feet MSL. Average annual precipitation is about 10 to 12 inches (ustic-aridic soil moisture regime). Average annual air temperature is about 47 to 49 degrees F. (mesic soil temperature regime). The average freeze-free period is 110 to 135 days per year (Jansen and Borchert, 1988).

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Map Unit A: Hernandez loam, 1 to 6% slopes

Hernandez loam was described and sampled at five representative locations (WC1, WC2, WC6, WC7, and WC10). Hernandez was also described but not sampled at WC3. Although there are some differences among the six sites, each soil classifies as the Hernandez series. The Hernandez family, Map Unit 52, was also mapped for the area by NRCS on Sheet 8 of its Soil Survey of Carbon Area, Utah (Jansen and Borchert, 1988).

Hernandez family is a very deep, well drained soil mapped on uplands in the general area. The soil is developing in local alluvium derived dominantly from sandstone and shale. Site vegetation includes Wyoming big sagebrush and mixed grasses. Based on NRCS data, Hernandez has moderate permeability, high available water capacity (9.0 to 10.5 inches), slow runoff, and water supplying capacity of 5.5 to 6.5 inches. Effective rooting depth is 60 inches or more, the organic matter content of the surface layer is generally 1 to 3 percent, and the hazard of wind and water erosion is moderate (Jansen and Borchert, 1988). The Range Site for Hernandez is Semidesert Loam (Wyoming Big Sagebrush).

Hernandez is classified as a "Fine-loamy, mixed, superactive, mesic Ustic Haplocalcid".

Hernandez is an established soil series of moderate extent. The most recent NRCS official soil series description, dated October 2002, is on file at Mt. Nebo Scientific. Hernandez sites WC1, WC2, and WC3 were previously described in the one acre study area report, and are also included in the current report.

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Hernandez Pedon WC1 Site and Profile Description:

Map Unit A; 3% slope, east-southeast aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 8 inches; 3 inches of coal fines deposition from the adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common coarse, medium and many fine and very fine roots to 13 inches; moderately effervescent, slightly alkaline (pH 7.7); gradual smooth boundary.

Bw (cambic) horizon – 3 to 13 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, slightly alkaline (pH 7.7); clear wavy boundary.

Bk (calcic) horizon – 13 to 23 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; few coarse, medium, fine and very fine roots; violently effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 23 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.2); did not hit bedrock.

Hernandez Pedon WC2 Site and Profile Description:

Map Unit A; 4% slope; east-southeast aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 3 inches; 3 inches of coal fines deposition from adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; strong, medium platy structure (mechanically compacted); hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; few to common coarse and medium and many fine and very fine roots to 10 inches; strongly effervescent, moderately alkaline (pH 7.8); gradual smooth boundary.

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Bw (cambic) horizon – 3 to 10 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium platy structure (mechanically compacted); hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 7.8); clear wavy boundary.

Bk (calcic) horizon – 10 to 32 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive structure; extremely hard dry consistence; very firm moist consistence; sticky and slightly plastic wet consistence; few medium, fine, and very fine roots; violently effervescent, moderately alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 32 to 60 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; violently effervescent, strongly alkaline (pH 8.5); did not hit bedrock.

Hernandez Pedon WC3 Site and Profile Description:

Map Unit A; 3% slope' east-southeast aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; soil slightly moist to 9 inches; no erosion; 3 inches of coal fines deposition from adjacent wildcat Loadout facility; not sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick).

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common medium, fine, and very fine and few coarse roots to 9 inches; strongly effervescent; gradual smooth boundary.

Bw horizon – 3 to 9 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent; clear wavy boundary.

Bk1 horizon – 9 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive structure parting to moderate medium subangular blocky; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine and few coarse and medium roots; strongly effervescent; gradual wavy boundary.

Bk2 horizon – 18 to 32 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3)

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moist; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; few medium, fine, and very fine roots; violently effervescent; gradual wavy boundary.

Ck horizon – 32 to 52 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive structure; very hard dry consistence, very firm moist consistence, sticky and slightly plastic wet consistence; violently effervescent; gradual wavy boundary.

C horizon – 52 to 64 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; did not hit bedrock.

Hernandez Pedon WC6 Site and Profile Description:

Map Unit A; 4% slope; east aspect; mixed grasses, dead Wyoming big sagebrush vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 18 inches at time of sampling, 3-12-03; 3 inches of coal fines deposition from adjacent wildcat loadout facility; sampled for laboratory characterization.

Coal fines – 3 to 0 inches (3 inches thick)

A horizon- 0 to 3.5 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium granular structure; soft dry consistence, very friable moist, slightly sticky and slightly plastic wet consistence; common medium, fine, very fine, and few coarse roots to 13 inches; moderately effervescent, moderately alkaline (pH 7.9); gradual smooth boundary.

Bw horizon – 3.5 to 13 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/40) moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, sticky and slightly plastic wet consistence; moderately effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk horizon – 13 to 25 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, friable moist consistence; slightly sticky and slightly plastic wet consistence; common fine and very fine, and few coarse and medium roots 13 to 18 inches, few coarse, medium, fine, and very fine roots 18 to 25 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

Ck horizon – 25 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; very hard to extremely hard dry consistence; firm moist consistence, sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.4); gradual wavy boundary.

C horizon – 38 to 64 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish

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brown (10YR 4/4) moist; massive structure; hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; moderately effervescent, strongly alkaline (pH 8.5); did not hit bedrock.

Hernandez Pedon WC7 Site and Profile Description:

Map Unit A; 4% slope; east aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 10 inches at time of sampling, 3-13-03; 2 inches of coal fines deposition from adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 2 to 0 inches (2 inches thick)

A horizon – 0 to 3 inches; brown (10YR 5/3) loam with some areas with coal fines mixed in, brown (10YR 4/3) moist; weak medium granular structure; soft dry consistence, very friable moist consistence, sticky and slightly plastic wet consistence; many fine and very fine, and few coarse and medium roots to 10 inches; moderately effervescent, moderately alkaline (pH 7.9); gradual smooth boundary.

Bw horizon – 3 to 10 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; moderate to strongly effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk1 horizon – 10 to 22 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive structure; hard-very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; common fine and very fine, and few medium and coarse roots 10 to 22 inches; strongly effervescent, moderately alkaline (pH 7.9); common krotovinas from 10 to 38 inches; gradual wavy boundary.

Bk2 horizon – 22 to 38 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive structure; extremely hard dry consistence, very firm moist consistence, slightly sticky and nonplastic wet consistence; few fine and very fine roots 22 to 38 inches; violently effervescent, moderately alkaline (pH 8.3); gradual wavy boundary.

C horizon – 38 to 56 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.6); did not hit bedrock.

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Hernandez Pedon WC10 Site and Profile Description:

Map Unit A; 6% slope; east aspect; rabbitbrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 12 inches at time of sampling, 3-13-03; 1.5 inches of coal fines deposition from the adjacent Wildcat Loadout facility; sampled for laboratory characterization; sample site is just outside of the 12 acre study area but in an area for a future sedimentation pond.

Coal Fines – 1.5 to 0 inches (1.5 inches thick)

A horizon - 0 to 3 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) loam, weak medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common few and very few, and few coarse and medium roots to 12 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual smooth boundary.

Bw horizon – 3 to 12 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard dry consistence; friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

Bky horizon – 12 to 30 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and plastic wet consistence; few medium, fine, and very fine roots 12 to 24 inches; violently effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

C horizon – 30 to 62 inches; light yellowish brown (10YR 6/4) loam/sandy loam, pale brown (10YR 6/3) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.0); did not hit bedrock.

Hernandez Range of Characteristics:

The described and sampled pedons WC-1, WC-2, WC-3, WC-6, WC-7, and WC-10 are typical of Hernandez, and are within the range of characteristics for the Hernandez official soil series description (NRCS, October 2002).

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Hernandez Soil Suitability and Salvage Depth Recommendation:

Initial One-Acre Study Area

Based on an evaluation of the field and laboratory data (see Appendix), the Hernandez soil is entirely suitable throughout its profile depth to 54 inches or more. Soil textures are good with loam dominating the upper profile, and loam to clay loam in the lower profile. Soil salinity is low with electrical conductivity (EC) values less than 1 in the upper profile and 2 to 3 in the lower profile. Sodium Adsorption Ratio (SAR) is low throughout the profile with values less than 1 for all samples except the 32 to 54 inch depth interval of WC-2 (SAR=6.5). Soil reaction (pH) is slightly to moderately alkaline with values in the high 7's and low 8's (range of pH 7.7 to 8.5). Calcium carbonate content ranges from 9.7 to 18.7 percent and averages 13.9 percent across all samples. Organic matter content is somewhat high in the upper profile (2.8 to 3.6 percent) and generally low in the lower profile (0.5 to 0.9 percent).

If needed, the entire profile to 54 inches or more could be salvaged for use in reclamation activities. The better soil material is in the approximate upper 24 inches. Soil texture is loam and organic matter content is somewhat high in this upper 2 feet. EC and SAR values are low. Soil texture is good and the soil material can be easily handled. If a more limited amount of soil material is needed, the upper 24 inches can be salvaged as Topsoil. Additional underlying material could be salvaged, as needed, for use as Subsoil.

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Larger Eleven-Acre Study Area

Soil description and sample sites WC6, WC7, and WC10 were evaluated for suitability and salvage depth recommendation for the remaining 11 acre study area. WC10 is located in a proposed sedimentation pond area just outside the 11 acre study area but was included in the evaluation of Hernandez. The upper 25 inches of WC6 is good rated. The depth between 25 and 38 inches is good rated except both EC (5.5) and SAR (9.1) are fair rated. The lower zone between 38 and 64 inches has poor EC (10.1) and unacceptable SAR (16.7). The upper 38 inches of WC7 is good rated; between 38 and 56 inches is good rated except for fair rated SAR (6.8). The upper 12 inches of WC10 is good rated; between 12 and 30 inches has fair to poor EC (8.5) and fair SAR (8.4). Both EC (12) and SAR (10.4) are poor rated for the zone between 30 and 62 inches. For laboratory reports, refer to the Appendix of this document.

Given that WC10 is located outside the 11 acre study area, it is recommended that the upper 38 inches of Map Unit A be salvaged as Topsoil. The underlying material has good to poor rated EC and fair to unacceptable SAR. If additional material is needed and can be somewhat mixed during salvage, it is possible to salvage this lower material between 38 and about 62 inches as Subsoil.

Map Unit B: Haverdad loam, 2 to 8% slopes

Haverdad loam was described and sampled at two representative locations, WC4 and WC8.

Haverdad loam was previously mapped by NRCS as a soil inclusion along drainageways in Map

Unit 52 of the Soil Survey of Carbon Area, Utah (Jansen and Borchert, 1988). Haverdad loam is a very deep, well drained soil mapped in small upland drainageways in the general area. The soil is developing in local alluvium derived dominantly from sandstone and shale. Site vegetation includes mixed grasses, sagebrush, and occasional scattered greasewood.

Permeability of Haverdad is moderate. Available water capacity is about 10 inches. Effective rooting depth is 40 inches or more. Runoff is slow, and the hazard of wind and water erosion is moderate (Jansen and Borchert, 1988). The Range Site for Borchert is Semidesert Loam (Wyoming Big Sagebrush).

Haverdad is classified as a "Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvent". Haverdad is an established soil series of moderate extent. The most recent NRCS official soil series description, dated June 2002, is on file at Mt. Nebo Scientific. Haverdad site and profile descriptions for WC4 and WC8 follow.

Haverdad Pedon WC4 Site and Profile Description:

Map Unit B; 3% slope; east aspect; mixed grasses and few scattered greasewood vegetation; fine-loamy local alluvium with <1% coarse fragments; small fan on side of small upland drainage; no erosion; soil slightly moist to 14 inches at time of sampling, 3-12-03; 3 inches of coal fines deposition from adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick)

A horizon – 0 to 4 inches; yellowish brown (10YR 5/6) loam, dark yellowish brown (10YR 4/6) moist; moderate medium granular structure; slightly hard dry consistence,

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friable moist consistence, slightly sticky and slightly plastic wet consistence; many medium, fine, and very fine, and few coarse roots to 14 inches; strongly effervescent, moderately alkaline (pH 8.3); gradual smooth boundary.

Bw horizon – 4 to 14 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.5); gradual wavy boundary.

Bk horizon – 14 to 28 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine and few medium roots; strongly effervescent, moderately alkaline (pH 8.3); gradual wavy boundary.

C horizon – 28 to 58 inches; yellowish brown (10YR 5/4) loam to sandy loam, brown (10YR 4/3) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; few fine and very fine roots 28 to 44 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

2C "red" horizon – 58 to 70+ inches; brown (7.5YR 5/4) gravelly loam, dark brown (7.5YR 4/4) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; slightly effervescent; this horizon not sampled.

Haverdad Pedon WC8 Site and Profile Description:

Map Unit B; 2% slope; east aspect; big sagebrush and mixed grasses (mostly dead) vegetation; fine-loamy local alluvium with < 2% sandstone gravels; small upland drainage; no erosion; 3 inches of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist to 26 inches at time of sampling, 3-13-03; sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick)

A horizon – 0 to 4 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium platy structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common coarse, medium, fine, and very fine roots to 12 inches; moderately effervescent, slightly alkaline (pH 7.7); gradual smooth boundary.

Bw horizon – 4 to 12 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet

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consistence; moderately effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk horizon – 12 to 26 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine, and few coarse and medium roots; strongly effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 26 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few coarse, medium, fine, and very fine roots; krotovinas present; moderately effervescent, moderately alkaline (pH 7.9); gradual wavy boundary.

C horizon – 38 to 64 inches; yellowish brown (10YR 5/4) loam-sandy loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; moderately effervescent, moderately alkaline (pH 7.9); did not hit bedrock.

Haverdad Range of Characteristics:

The described and sampled pedons WC4 and WC8 are typical of Haverdad and are within the range of characteristics for the Haverdad official soil series description (NRCS, June 2002).

Haverdad Soil Suitability and Salvage Depth Recommendations:

Based on an evaluation of the field and laboratory data (see Appendix), Haverdad loam is entirely suitable throughout its profile depth to 54 inches or more. Soil textures are good with loam dominating the upper profile to about 38 inches, and loam to sandy loam to gravelly loam present in the lower substratum. Soil salinity is low with electrical conductivity (EC) values about 0.5 to 2 in the upper profile, and about 0.5 to 4 in the lower "C" horizon. Sodium Adsorption Ratio (SAR) is generally less than 1.0 but can range up to about 4.5 to 6.0 below 14 inches in some

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pedons. Soil reaction (pH) is slightly to strongly alkaline with values between 7.7 and 8.5.

Calcium carbonate content ranges from about 6 to 11 percent. Organic matter content ranges from about 1.2 to 1.9 percent in the surface layer, to about 0.9 to 1.5 percent at depth in the profile.

If needed, the entire profile to 54 inches or more could be salvaged for use in reclamation activities. The better soil material is in the approximate upper 28 inches. Soil texture is loam and organic matter is about 1 to almost 2 percent. EC and SAR are generally low. Soil texture is good and the soil material can be easily handled. If a more limited amount of soil material is needed, the upper 28 inches can be salvaged as Topsoil. Additional underlying material could be salvaged, as needed, for use as Subsoil.

Map Unit C: Strych Variant, shallow to moderately deep, 2 to 6% slopes

Strych Variant was described and sampled at two representative locations (WC5 and WC9).

Strych (deep) was previously mapped in the area as a 10% soil inclusion in NRCS Map Unit 52 (Jansen and Borchert, 1988). Although the official Strych soil series is deep to very deep, the site-specific Strych Variant soil on the Wildcat study area is shallow to moderately deep (10 inches to slightly greater than 20 inches to sandstone bedrock). Strych Variant is developing in thin slopewash alluvium and residuum from calcareous sandstone. Vegetation is open, scattered Pinyon-Juniper woodland with a mixed grass understory.

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Strych Variant is shallow to moderately deep and well drained. Strych Variant typically has a pale brown to yellowish brown gravelly to very gravelly loam surface layer about 3 inches thick. The "Bw" cambic upper subsoil layer is a pale brown to light yellowish brown gravelly to very gravelly loam to a depth of about 8 or 9 inches. The underlying "Bk" calcic horizon is a pale to very pale brown very to extremely gravelly loam to sandy loam to a depth of about 15 or 16 inches. The substratum is a mixture of "C" horizon and paralithic "Cr" extremely gravelly loam to bedrock encountered at about 20 to 23 inches in depth.

Strych Variant has moderately rapid permeability, low available water capacity, and an effective rooting depth equal to the depth to bedrock. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is medium, and the water erosion hazard is moderate. The Range Site is Semidesert Bouldery Loam (Jansen and Borchert, 1988). Strych Variant is classified as a "Loamy-skeletal, mixed, superactive, mesic, shallow Ustic Haplocalcid". The most recent NRCS official soil series description for Strych, dated October 2002, is on file at Mt. Nebo Scientific.

Strych Variant Pedon WC5 Site and Profile Description:

Map Unit C; 8% slope; south aspect; Pinyon-Juniper and scattered mixed grasses vegetation; thin residuum from sandstone; upland low ridge; slight erosion; 2 inches of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist at time of sampling, 3-12-03; not sampled for laboratory analysis.

Coal Fines – 2 to 0 inches (2 inches thick, varies up to 6 inches thick)

A horizon – 0 to 3 inches; pale brown (10YR 6/3) gravelly loam with about 20% sandstone gravels, brown (10YR 5/3) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet

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consistence; many fine and very fine, common medium and coarse roots to 8 inches; strongly effervescent; gradual smooth boundary.

Bw horizon – 3 to 8 inches; pale brown (10YR 6/3) gravelly loam with about 25% sandstone gravels, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard dry consistence; friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent; gradual wavy boundary.

Bk horizon – 8 to 15 inches; very pale brown (10YR 7/30) very gravelly silt loam to light silty clay loam with about 45% sandstone gravels; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; few coarse, medium, fine, and very fine roots; violently effervescent; gradual wavy boundary.

C/Cr mixed horizon (weathered, fractured sandstone with calcium carbonate and soil fines in cracks and beneath rock fragments) – 15 to 20 inches; pale brown (10YR 6/3) extremely gravelly loam with about 65% sandstone gravels, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few roots in cracks and beneath rock fragments; violently effervescent.

Strych Variant Pedon WC9 Site and Profile Description:

Map Unit C; 8% slope; south aspect; Pinyon-Juniper and mixed grasses vegetation; thin eolian over thin residuum from sandstone; low weathered ridge; slight erosion; 1 inch of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist to 9 inches at time of sampling, 3-12-03; sampled for laboratory analysis.

Coal Fines – 1 to 0 inches (1 inch thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) very gravelly loam with about 25% gravel size sandstone chips, dark yellowish brown (10YR 4/4) moist; weak medium granular structure; slightly hard dry consistence, friable moist consistence; slightly sticky and slightly plastic wet consistence; many medium, fine, and very fine roots to 9 inches; strongly effervescent, slightly alkaline (pH 7/6); clear smooth boundary.

Bw horizon – 3 to 9 inches; light yellowish brown (10YR 6/4) very gravelly loam with about 55% gravel size sandstone chips, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard-hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, slightly alkaline (pH 7.5); gradual wavy boundary.

Bk horizon – 9 to 16 inches; pale brown (10YR 6/3) extremely gravelly loam-sandy loam with about 75% gravel size sandstone chips, brown (10YR 5/3) moist; massive structure; hard-very hard dry consistence, friable moist consistence, slightly sticky and slightly plastic

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wet consistence; common to few medium, fine and very fine roots; violently effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

C/Cr mixed horizon (weathered, fractured sandstone with calcium carbonate and soil fines in cracks and beneath rock fragments) – 16 to 23 inches; pale brown (10YR 6/3) extremely gravelly sandy loam with over 75% gravel and cobble size sandstone chips, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few roots in cracks and beneath rock fragments; violently effervescent; horizon not sampled for laboratory analysis.

Strych Variant Range of Characteristics:

Depth to the weathered sandstone contact ranges from about 15 to 16 inches. Coarse fragment content ranges from 20 to 25% for the surface layer, from 25 to 55% for the upper subsoil layer (Bw), from 45 to 75% for the lower subsoil layer (Bk), and over 65% for the weathered substratum. Reaction (pH) is typically slightly alkaline (pH from 7.5 to 7.8). Soil fines are typically loam to sandy loam.

Strych Variant Soil Suitability and Salvage Depth Recommendation:

Strych Variant is entirely suitable for salvage. EC and SAR are very low, organic matter content ranges from 2.6% in the surface layer, to 2.3% in the upper subsoil, to 0.9% in the lower subsoil. Calcium carbonate content is fair rated with values ranging from 21 to 27 percent. Soil texture (fines) are loam to sandy loam. Coarse fragment content can be moderate to very high. The upper 12 inches can be salvaged as Topsoil, with the underlying material left in place to aid reclamation after mining activities are completed. For laboratory reports, refer to the Appendix

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of this document.

Map Unit DL: Disturbed Land

One sedimentation pond is present in the study area, and it is mapped as Disturbed Land. It is immediately adjacent to the current Wildcat Loadout facility. Soil salvage was not evaluated and is not recommended due to the amount of coal fines deposition in the pond. In addition, there is another Disturbed Land delineation in the study area – a recent oil and gas drilling pad. This bladed and highly compacted pad area is in the south-central to south-east portion of the study area, and has no soil available for salvage. It appears that topsoil was not salvaged during the construction of the pad because no soil stockpile was evident near the pad during the current soil survey.

REFERENCES

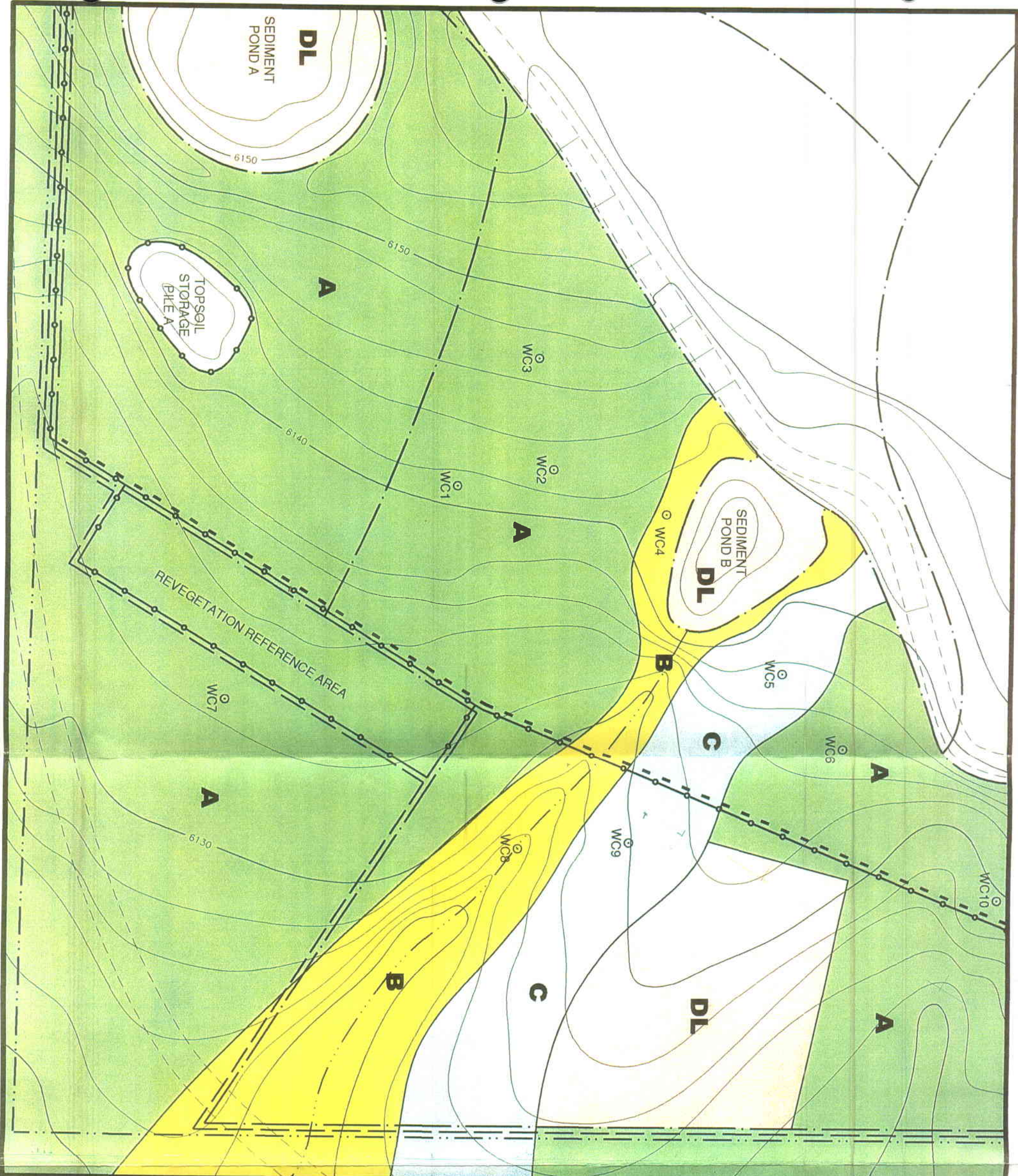
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LEGEND

- A** MAP UNIT A
HERNANDEZ LOAM, 1 TO 6% SLOPES
 - B** MAP UNIT B
HAVERDAD LOAM, 2 TO 8% SLOPES
 - C** MAP UNIT C
STRYCH VARIANT, SHALLOW TO
MODERATELY DEEP, 2 TO 6% SLOPES
 - DL** MAP UNIT D
DISTURBED LAND
- SOIL SAMPLE LOCATIONS



SOIL SURVEY MAP
12 ACRE STUDY AREA

ANDALEX RESOURCES, INC.
WILDCAT LOADOUT

MT. NEBO SCIENTIFIC, INC.
RESEARCH & CONSULTING
Div. of Oil, Gas & Mining

FIELD MAPPED: J. NYENHUIS
DRAWN: G. BARTON
CHECKED: P. COLLINS
DATE: JULY 08, 2003
FILE: MAP01 NEBO-ANDALEX-WILDCAT/12 ACRE SOIL V01.DWG

APPENDIX
(Laboratory Data)

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Soil and Plant Analysis Lab
255 WIDB
Brigham Young University
Provo, Utah 84602
801-378-2147

Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 84663
Date: 3/14/03

SOIL ID: Wildcat

Customer Sample ID	ppm P	ppm NO3-N	%OM	pH	EC dS/M	%Sand	%Clay
Wildcat 1 East 0-13"	4.52	4.39	2.79	7.68	0.65	43.84	24.72
Wildcat 1 East 13-23"	0.03	5.32	0.56	7.83	0.58	47.84	16.72
Wildcat 1 East 23-54"	1.51	2.07	0.67	8.18	2.00	26.56	29.72
Wildcat 2 North 0-12"	3.77	4.13	3.64	7.81	0.62	38.56	24.72
Wildcat 2 North 12-32"	0.79	2.67	0.90	7.83	0.60	32.20	25.72
Wildcat 2 North 32-54"	4.99	1.23	0.48	8.46	3.00	32.56	23.72

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Soil and Plant Analysis Lab
255 WIDB
Brigham Young University
Provo, Utah 84602
801-378-2147

Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 84666
Date: 3/14/03

SOIL ID: Wildcat

Customer Sample ID	%Silt	ppm Ca-SAR	ppm Mg-SAR	ppm K-SAR	ppm Na-SAR	SAR
Wildcat 1 East 0-13"	31.44	129.20	29.44	40.65	13.51	0.28
Wildcat 1 East 13-23"	35.44	97.56	36.75	6.90	17.34	0.38
Wildcat 1 East 23-54"	43.72	49.15	142.00	6.10	60.82	0.99
Wildcat 2 North 0-12"	36.72	115.10	21.62	10.87	16.31	0.36
Wildcat 2 North 12-32"	42.08	92.96	30.80	9.29	21.07	0.48
Wildcat 2 North 32-54"	43.72	32.78	220.40	22.23	469.70	6.46

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Soil and Plant Analysis Lab
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Provo, Utah 84602
801-378-2147

Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 84666
Date: 3/14/03

SOIL ID: Wildcat

Customer Sample ID	%Moisture Sat.	%CaCO ₃	ppm HCO ₃
Wildcat 1 East 0-13"	35.17	9.66	270.25
Wildcat 1 East 13-23"	33.50	18.68	181.90
Wildcat 1 East 23-54"	39.56	15.55	161.11
Wildcat 2 North 0-12"	36.60	10.77	187.10
Wildcat 2 North 12-32"	37.29	13.75	174.11
Wildcat 2 North 32-54"	34.70	15.11	166.31

Mr Patrick Collins/Mt Nebo Scientific Int
330 East 400 South Suite 6
P O Box 337
Springville UT 84663

Copy to
James Nyenhuis, Certified Soil Scientist

Colorado State University
Soil, Water and Plant Testing Laboratory
Natural & Environmental Sciences Bldg - A319
Fort Collins, CO 80523-1120

DATE RECEIVED: 03-17-2003
DATE REPORTED: 04-15-2003

(970) 491-5061 FAX: 491-2930

BILLING: 5319592

RESEARCH SOIL ANALYSIS

ANDALEX RESOURCES, WILDCAT LOADOUT, HELPER, UTAH

Lab #	Sample ID #	paste		EC mmhos/cm	% saturation	Lime Estimate	% OM	NO ₃ -N	P	K	AB-DTPA Extract			
		pH	mmhos/cm								ppm	Zn	Fe	Mn
R3518	WC4 0-4	8.3	0.9	37.2	High	1.2	1.4	5.2	176	<0.01	4.49	1.05	0.63	
R3519	WC4 4-14	8.5	0.7	36.7	High	1.0	1.5	4.5	147	<0.01	3.52	0.83	0.57	
R3520	WC4 14-28	8.3	1.7	33.4	High	1.0	1.2	2.6	141	<0.01	4.11	0.72	0.87	
R3521	WC4 28-58	8.0	4.2	36.2	High	0.9	0.9	3.4	117	<0.01	2.52	0.56	0.71	
R3522	WC6 0-3 1/2	7.9	0.6	36.4	High	2.1	3.0	11.0	360	0.16	4.06	2.10	1.50	
R3523	WC6 3 1/2-13	7.8	0.5	41.3	High	1.6	3.2	0.5	192	<0.01	3.81	0.97	0.93	
R3524	WC6 13-25	8.0	0.5	37.7	High	1.2	2.3	0.5	84.9	<0.01	6.19	0.97	0.95	
R3525	WC6 25-38	8.4	5.5	39.8	High	1.2	1.4	1.4	97.9	<0.01	7.03	0.83	0.77	
R3526	WC6 38-64	8.5	10.1	45.6	High	1.7	1.6	4.5	174	0.07	6.12	0.77	1.14	
R3527	WC7 0-3	7.9	0.5	35.1	High	2.6	1.8	7.5	274	0.29	4.62	1.78	1.54	
R3528	WC7 3-10	7.8	0.5	36.5	High	2.1	2.2	0.5	273	0.05	4.27	0.95	1.29	
R3529	WC7 10-22	7.9	0.4	41.1	High	1.9	3.0	0.4	103	<0.01	4.72	1.03	1.14	
R3530	WC7 22-38	8.3	1.7	47.2	High	1.8	1.7	1.4	116	<0.01	4.77	1.10	0.91	
R3531	WC7 38-56	8.6	2.4	36.5	High	1.2	1.4	4.0	106	<0.01	4.42	0.77	0.64	
R3532	WC8 0-12	7.7	0.9	36.1	High	1.9	18.9	3.3	207	0.23	4.34	1.14	1.44	
R3533	WC8 12-26	7.8	0.6	37.1	High	1.7	7.5	0.5	159	<0.01	3.51	0.74	0.93	
R3534	WC8 26-54	7.9	0.4	33.5	High	1.5	2.6	0.6	81.5	<0.01	4.68	0.81	1.06	
R3535	WC9 0-3	7.6	0.6	42.5	High	2.6	6.1	2.5	171	0.18	6.91	1.80	1.38	
R3536	WC9 3-9	7.5	1.0	45.9	High	2.3	11.5	0.6	104	<0.01	5.51	1.28	1.04	
R3537	WC9 9-16	7.8	0.5	43.4	High	0.9	6.1	0.6	55.3	0.01	3.18	0.86	1.03	
R3538	WC10 0-12	8.0	1.7	38.1	High	1.5	1.2	1.7	91.5	<0.01	4.36	0.72	0.64	
R3539	WC10 12-30	8.0	8.5	42.5	High	1.9	0.9	4.4	115	0.04	5.14	0.81	0.63	
R3540	WC10 30-62	8.0	12.0	35.0	High	1.2	0.9	3.8	84.7	0.08	2.49	0.67	0.35	

INCORPORATED

MAY 17 2003

Div. of Oil, Gas & Mining

Mr Patrick Collins/Mt Nebo Scientific Inc
330 East 400 South Suite 6
P O Box 337
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Copy to James Nyenhuis, Certified Soil Scientist

Colorado State University
Soil, Water and Plant Testing Laboratory
Natural & Environmental Sciences Bldg - A319
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DATE RECEIVED: 03-17-2003
DATE REPORTED: 04-15-2003

(970) 491-5061 FAX: 491-2930

BILLING: 5319592

RESEARCH SOIL ANALYSIS
ANALEX RESOURCES, WILDCAT LOADOUT, HELPER, UTAH

Lab #	Sample ID #	-----%			Clay	Texture	very fine sand from hydrometer	% CaCO ₃ equiv	-----meq/L				SAR
		Sand	Silt						Ca	Mg	Na	K	
R3518	WC4 0-4	42	35	23	Loam	38	11.8	2.0	6.8	2.2	0.6	1.0	
R3519	WC4 4-14	42	38	20	Loam	42	12.8	0.9	5.9	1.4	0.6	0.7	
R3520	WC4 14-28	40	40	20	Loam	38	13.6	2.7	5.4	11.3	0.6	5.6	
R3521	WC4 28-58	48	36	16	Loam/Sandy Loam	46	11.3	15.4	17.9	18.8	<0.1	4.6	
R3522	WC6 0-3½	36	36	28	Clay Loam	31	10.5	3.5	1.5	1.7	0.9	1.1	
R3523	WC6 3¼-13	30	40	30	Clay Loam	30	14.2	2.9	1.4	0.8	0.4	0.5	
R3524	WC6 13-25	38	39	23	Loam	38	11.6	1.8	2.3	1.3	0.2	0.9	
R3525	WC6 25-38	38	41	21	Loam	38	11.8	4.1	21.5	32.5	0.1	9.1	
R3526	WC6 38-64	28	40	32	Clay Loam	24	11.8	4.8	29.8	69.3	0.2	16.7	
R3527	WC7 0-3	40	34	26	Loam	38	6.40	3.8	1.2	0.7	0.3	0.5	
R3528	WC7 3-10	38	46	16	Loam	38	7.10	2.9	1.1	0.7	0.4	0.5	
R3529	WC7 10-22	30	42	28	Clay Loam	29	14.2	1.6	1.7	0.8	0.1	0.6	
R3530	WC7 22-38	21	48	31	Clay Loam	18	16.6	1.8	9.4	6.8	0.2	2.9	
R3531	WC7 38-56	40	41	19	Loam	40	12.3	1.0	8.6	14.9	0.5	6.8	
R3532	WC8 0-12	36	45	19	Loam	36	6.17	6.3	1.6	0.5	0.2	0.3	
R3533	WC8 12-26	39	39	22	Loam	39	9.43	3.4	1.1	0.7	0.3	0.4	
R3534	WC8 26-54	42	39	19	Loam	42	8.15	1.7	1.2	0.7	0.1	0.6	
R3535	WC9 0-3	48	29	23	Loam	37	27.1	3.6	1.1	0.5	0.3	0.3	
R3536	WC9 3-9	49	30	21	Loam	47	21.7	4.5	2.0	0.5	1.6	0.3	
R3537	WC9 9-16	52	30	18	Loam/Sandy Loam	51	21.8	2.8	1.4	0.4	0.1	0.3	
R3538	WC10 0-12	34	44	22	Loam	33	14.4	7.2	7.8	1.3	<0.1	0.5	
R3539	WC10 12-30	22	50	28	Clay Loam	17	10.7	17.4	25.7	38.9	<0.1	8.4	
R3540	WC10 30-62	43	39	18	Loam/Sandy Loam	43	8.04	18.0	28.6	50.4	<0.1	10.4	

INCORPORATED

MAY 17 2003

Div. of Oil, Gas & Mining

APPROVED
TITLE

James P. Nyenhuis
Extension Soil Testing Specialist

APPENDIX D
(SUPPLEMENT)

SOILS REPORT
MATERIAL STORAGE AREA
PRISCILLA BURTON



Soil Analysis Report
West Ridge Resources, Inc.
P.O. Box 1077
Price, Utah 84501

Report ID: S0704107001

Project: Soil and Coal Waste Analysis
Date Received: 4/9/2007

Date: 5/7/2007
Work Order: S0704107

Lab ID	Sample ID	pH	Electrical		Organic		Calcium	Magnesium	Sodium	Potassium	Available	
		s.u.	Saturation	Conductivity	Matter	%	meq/L	meq/L	meq/L	meq/L	meq/L	meq/100g
S0704107-001	Tan-Topsoll	7.9	46.7	0.32	1.8	1.8	1.85	1.08	0.17	0.31	0.39	
S0704107-002	Gray - Coal Mine Waste	7.3	42.2	8.55	6.9	6.9	28.3	27.7	27.9	1.37	0.50	

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Soil Analysis Report
West Ridge Resources, Inc.
P.O. Box 1077
Price, Utah 84501

Report ID: S0704107001

Date: 5/7/2007

Work Order: S0704107

Project: Soil and Coal Waste Analysis

Date Received: 4/9/2007

Lab ID	Sample ID	Sand			Silt	Clay	Texture		Very Fine		Nitrogen		Phosphorus	Selenium	CO3
		%			%	%			%	%	ppm	ppm	ppm	ppm	%
S0704107-001	Tan-Topsoil	50.0			36.0	14.0	Loam		45.6		0.84		0.71		8.2
S0704107-002	Gray - Coal Mine Waste	60.0			26.0	14.0	Sandy Loam		23.7		19.6		3.02	0.09	9.4

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2Osol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A. Secor
Karen Secor, Soil Lab Supervisor



Soil Analysis Report
West Ridge Resources, Inc.
P.O. Box 1077
Price, Utah 84501

Report ID: S0704107001

Date: 5/7/2007

Work Order: S0704107

Project: Soil and Coal Waste Analysis
Date Received: 4/9/2007

Lab ID	Sample ID	Total		T.S.		Neut.		T.S.	
		Sulfur	%	AB	U/1000t	Pot.	U/1000t	ABP	U/1000t
S0704107-001	Tan-Topsoil								
S0704107-002	Gray - Coal Mine Waste	0.39		12.2		116		103	

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

APPENDIX I
(SUPPLEMENT)

VEGETATION REFERENCE REPORT
MT. NEBO SCIENTIFIC

**Proposed New Sagebrush/Grass Reference
for the Wildcat Loadout
April 9, 2007**

Andalex Resources has proposed an expansion to the existing coal stockpile at the Wildcat Loadout site. If the stockpile were expanded, it would impact the existing vegetation reference area. This reference area had been chosen previously to represent future standards for revegetation success at the time of final reclamation at the loadout site. Because the reference area would be impacted by the proposed loadout expansion operations, a new Sagebrush/Grass Reference Area has been selected to replace the existing one. Incorporation of the proposed new reference area to the Mining and Reclamation Plan (MRP) is contingent on approval by the State of Utah, Division of Oil, Gas & Mining (DOGM).

A general description of the proposed new reference area has been provide below. Vegetation sampling will also be conducted in the reference area during the growing season of 2007 to quantitatively document it as an acceptable area to represent future revegetation success standards for the Wildcat Loadout. Results of the sampling will be submitted to DOGM for final approval of the new reference area.

The Wildcat Loadout site was visited by representatives from *Andalex Resources* (D. Shaver) and *Mt. Nebo Scientific, Inc.* (P. Collins) on March 15, 2007. The objective of the field visit was to establish potential locations for the new reference area. Although there were several possibilities for such a site, one site appeared to be the best candidate.

The proposed new Sagebrush/Grass Reference Area is located in a plant community very similar to the one that was disturbed by construction of the current loadout facility (see Table 1 for GPS coordinates of the site). Common plant species of the site are shown in Table 2. A photograph of the proposed new reference area is shown in Figure 1.

Table 1: Coordinates for the proposed new Sagebrush/Grass Reference Area at the Wildcat Loadout.

Waypoint Name	Zone	Easting (m)	Northing (m)	Name
AWCSRF	12S	0506974	4388164	Sagebrush/Grass Reference Area

Table 2: Plant species common in the proposed new Sagebrush/Grass Reference Area at the Wildcat Loadout.

SCIENTIFIC NAME	COMMON NAME
Trees/Shrubs	
<i>Artemisia tridentata</i>	Big sagebrush
<i>Ceratoides lanata</i>	Winterfat
<i>Echinocereus triglochidiatus</i>	Claretcup
<i>Gutierrezia sarothrae</i>	Broom snakeweed
<i>Juniperus osteosperma</i>	Utah juniper
<i>Opuntia polyantha</i>	Central pricklypear
Grasses	
<i>Bouteloua gracilis</i>	Blue grama
<i>Stipa hymenoides</i>	Indian ricegrass
<i>Stipa nelsonii</i>	Nelson's needlegrass

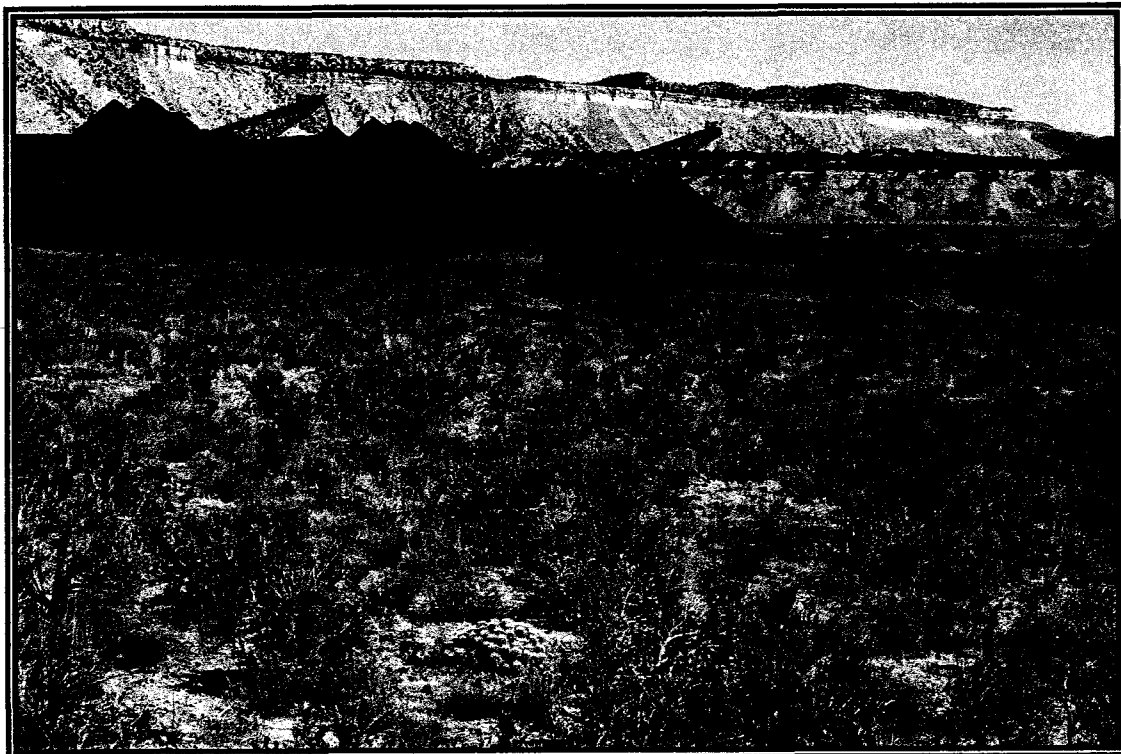


Figure 1: Proposed New Sagebrush/Grass Reference Area for the Wildcat Loadout

msc

APPENDIX O
(SUPPLEMENT)

CHEMICAL ANALYSIS OF
REFUSE MATERIAL



Soil Analysis Report

West Ridge Resources, Inc.

P.O. Box 1077

Price, Utah 84501

Report ID: S0704107001

Project: Soil and Coal Waste Analysis

Date Received: 4/9/2007

Date: 5/7/2007

Work Order: S0704107

Lab ID	Sample ID	pH		Saturation %	Electrical Conductivity		Organic Matter %	Calcium meq/L	Magnesium meq/L	Sodium meq/L	Potassium		Available	
		s.u.			dS/m						meq/L	meq/100g		
S0704107-001	Tan-Topsoil	7.9		46.7	0.32		1.8	1.85	1.08	0.17	0.31	0.39		
S0704107-002	Gray - Coal Mine Waste	7.3		42.2	8.55		6.9	28.3	27.7	27.9	1.37	0.50		

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by:

Karen A Secor

Karen Secor, Soil Lab Supervisor



Soil Analysis Report

West Ridge Resources, Inc.

P.O. Box 1077

Price, Utah 84501

Report ID: S0704107001

Project: Soil and Coal Waste Analysis

Date Received: 4/9/2007

Date: 5/7/2007

Work Order: S0704107

Lab ID	Sample ID	Sand			Silt	Clay	Texture	Very Fine		Nitrogen		Phosphorus	Selenium	CO3
		%	%	%				Sand	%	Nitrate	ppm			
S0704107-001	Tan-Topsoil	50.0	36.0	14.0		Loam		45.6		0.84	0.71			8.2
S0704107-002	Gray - Coal Mine Waste	60.0	26.0	14.0		Sandy Loam		23.7		19.6	3.02		0.09	9.4

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by:

Karen A. Secor

Karen Secor, Soil Lab Supervisor



Soil Analysis Report
West Ridge Resources, Inc.

P.O. Box 1077
Price, Utah 84501

Report ID: S0704107001

Project: Soil and Coal Waste Analysis

Date Received: 4/9/2007

Date: 5/7/2007

Work Order: S0704107

Lab ID	Sample ID	Total Sulfur		T.S.		Neut.		T.S.	
		%	t/1000t	AB	t/1000t	Pot.	t/1000t	ABP	t/1000t
S0704107-001	Tan-Topsoil								
S0704107-002	Gray - Coal Mine Waste	0.39	12.2		116				103

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A. Secor
Karen Secor, Soil Lab Supervisor

APPENDIX R

SEDIMENTATION AND DRAINAGE CONTROL
PLAN

APPENDIX R

WILDCAT LOADOUT

SEDIMENTATION AND DRAINAGE CONTROL PLAN



PREPARED BY: DAN W. GUY, P.E.
BLACKHAWK ENGINEERING, INC.
APRIL 2007

**SEDIMENTATION AND DRAINAGE CONTROL PLAN
WILDCAT LOADOUT
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SEDIMENTATION AND DRAINAGE CONTROL PLAN
WILDCAT LOADOUT
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SEDIMENTATION AND DRAINAGE CONTROL PLAN
WILDCAT LOADOUT
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Appendix 1 - Computer Backup Data

**WILDCAT LOADOUT
SEDIMENTATION AND DRAINAGE CONTROL PLAN**

1. Introduction

The Sedimentation and Drainage Control Plan for the Wildcat Loadout has been designed according to the State of Utah R645 - Coal Mining Rules, (revised August 1, 2001). This plan represents the proposed drainage control plan. All design criteria and construction has been certified by a Utah Registered Professional Engineer.

The entire drainage and control plan has been re-evaluated and updated for 2 main reasons:

- (1) To evaluate the adequacy and provide up-to-date calculations for existing drainage controls, and;**
- (2) To provide an overall plan to accommodate the proposed modifications to the site.**

The proposed changes to the site plan include the following:

- (1) The existing coal storage area will be enlarged;**
- (2) A 150' wide "drop-zone" for coal dust will be provided downwind of the coal storage pile;**
- (3) Sediment ponds "A", "B" and "D" will be eliminated and replaced with new sediment ponds "G", "H" and "I" located downgrade from the existing ponds;**
- (4) Sediment ponds "E" and "F" will be enlarged to ensure adequate capacity for the new drainage system;**
- (5) A new material storage yard will be added on the west side of the site and drained to the enlarged sediment pond "F";**
- (6) Existing diversion UD-1 will be converted to a disturbed ditch also draining to enlarged sediment pond "F";**

- (7) ASCA's 3, 4, 5, 6, and 7 will be eliminated and drained to new or enlarged sediment ponds;
- (8) New ASCA's will be established on the out slopes of the new sediment ponds.
- (9) The permit area is enlarged to 250 acres.

All existing and proposed structures are shown on updated Plates 1 and 2.

The general surface water control plan for this site consists of the following:

- (1) Wherever possible, undisturbed drainage is diverted around the site into natural channels;
- (2) The entire disturbed area (except the 5 small ASCA's) and portions of the undisturbed area not diverted, are drained to one of the 6 sediment ponds, permanent impoundment or depression area, via properly sized ditches and culverts;
- (3) There are 5 small Alternate Sediment Control Areas (A.S.C.A.). These areas are described in detail under Section 2.11.
- (4) All sediment ponds are sized to contain the runoff from a 10 year - 24 hour precipitation event, plus a minimum of 3 years sediment storage as described in Section 3 of this Appendix. The Permanent Impoundment and Depression Area are sized to contain the runoff from a 100 year - 6 hour precipitation event.

DESIGN OF DRAINAGE CONTROL STRUCTURES

Design Parameters

- 2.1 Precipitation
- 2.2 Flow
- 2.3 Velocity
- 2.4 Drainage Area
- 2.5 Slope Lengths
- 2.6 Runoff
- 2.7 Runoff Curve Numbers
- 2.8 Culvert Sizing
- 2.9 Culverts
- 2.10 Ditches
- 2.11 ASCA Areas
- 2.12 Erosion Control

Table 1	Drainage Area Data
2	Runoff Summary
3	Drainage Structures
4	Drainage Structure Flow Summary
5	Ditch Data
6	Ditch Design Summary
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Figures

- Figure 1 Culvert Nomograph
- Figure 2 Rip-Rap Chart
- Figure 3 Ditch, Typical Section (Unlined Ditch)
- Figure 4 Ditch, Typical Section (Lined Ditch)

Design Parameters

2.1 Precipitation

The precipitation-frequency values for the area were taken from "NOAA, Precipitation-Frequency Atlas of the Western U.S., Atlas 2, Volume VI.

<u>Frequency - Duration</u>	<u>Precipitation</u>
2 year - 6 hour	0.85"
10 year - 6 hour	1.23"
10 year - 24 hour	1.85"
25 year - 6 hour	1.48"
25 year - 24 hour	2.15"
100 year - 6 hour	1.91"

Disturbed ditch and culvert designs for runoff control are based on the 10 year - 24 hour event of 1.85" and the 25 year - 6 hour event of 1.48", where required.

Undisturbed culvert designs are based on the 10 year - 24 hour event of 1.85".

The sedimentation ponds are designed to contain the runoff from a 10 year - 24 hour event of 1.85" as required by the Division. Reclamation designs are based on the 100 year - 6 hour event of 1.91", where applicable for permanent structures.

ASCA areas are sized to contain or treat runoff from a 10 year - 24 hour precipitation event.

2.2 Flow

Peak flows, flow depths, areas and velocities were calculated using the computer program "Office of Surface Mining Watershed Model", Storm Version 6.20 by Gary E. McIntosh. (Trapezoidal Channel Flow). All flow is based on the SCS - TR55 Method for Type II storms.

Time of concentration of storm events was calculated for each drainage area using the following formula:

$$t_L = \frac{L^{0.8} (S+1)^{0.7}}{1900 Y^{0.5}}$$

where:

t_c	=	Time of Concentration (hrs.)
t_L	=	Lag Time (hrs.) = $0.6 t_c$
L	=	Hydraulic Length of Watershed (ft.)
Y	=	Average Land Slope (%)
S	=	$\frac{1000 - 10}{CN}$

2.3 Velocity

Flow velocities for each ditch structure were calculated using the Storm computer program with Manning's Formula:

$$V = \frac{1.49 R^{2/3} S^{1/2}}{n}$$

where: V = Velocity (fps)
R = Hydraulic Radius (ft.)
S = Slope (ft. per ft.)
n = Manning's n; Table 3.1, p.159,

"Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner & Haan, 1983.

Note: The following Manning's n were used in the calculations:

<u>Structure</u>	<u>Manning's n</u>
Culverts (cmp)	0.020
Rip-rapped or Natural Drainage Channels	0.035 - 0.040
Unlined Disturbed Area Ditches	0.035 - 0.040
Bedrock Channels with Rubble	0.030
Concrete Lined Channels	0.015

2.4 Drainage Areas

All drainage areas are designated with a DA-number (i.e. DA-2) as shown on Plate 2 and 15. All drainage areas were planimetered directly from As-Constructed Plate 2 (Drainage Map) and Plate 15 (Watershed Map).

2.5 Slopes, Lengths

All slopes and hydraulic lengths were measured directly from the topography on Plates 2 and 15.

2.6 Runoff

Runoff was calculated using the SCS Formula for Type II Storm:

$$Q = \frac{(P - 0.2 S)^2}{P + 0.8 S}$$

where: Q = Runoff in inches
 P = Precipitation in inches
 S = $\frac{1000 - 10}{CN}$
 CN = Runoff Curve Number

2.7 Runoff Curve Numbers

A runoff curve number of 90 was used for all disturbed areas. This is a conservative number based on the SCS determinations for Runoff Curve Numbers for Antecedent Moisture Condition II. A runoff curve number of 65 was used for undisturbed areas. this number is based on the SCS determinations for Runoff Curve Numbers for Antecedent Moisture Condition II, Soil Group B, Range Land in Fair to Good Condition.

The selection of the curve number is also based on field observations and subsequent discussions with DOGM personnel.

The native soil in the area is quite sandy and porous in nature, resulting in a relatively low runoff potential. This was the basis for the selection of SCS Soil Group B.

The runoff numbers were also checked against the chart in Figure 2.26, page 85, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner, and Haan, 1983.

2.8 Culvert Sizing

All culverts were sized using the "Haestad Methods, Flowmaster I, Version 3.43" Computer Program.

Minimum culvert sizing is based on the following Manning's Equation:

$$D = \left(\frac{2.16 Q n}{\sqrt{S}} \right)^{0.35}$$

where: D = Required Diameter (ft.)
 Q = QP = Peak Discharge (cfs)
 n = Roughness Factor (0.020 for cmp)
 S = Slope (ft. per ft.)

Using the above formula, minimum required culvert sizes were calculated for each applicable area. Culverts were then selected above the required minimum, and these sizes were checked for adequacy against the Culvert Nomograph included as Figure 1 of this report.

2.9 Culverts

Culverts have been sized according to the calculations previously described, and are shown on Plate 2, Drainage Control Map.

All culverts are designated with C-number (i.e. C-2) as shown on Plate 2. All culverts are sized to carry the runoff from a 10 year - 24 hour storm, which is well in excess of the 10 year - 6 hour storm required by the regulations. The only exceptions to the above culvert sizing is for culverts used as sediment pond overflows - these culverts are sized to carry the 25 year - 6 hour flows as required for sediment pond designs.

Culverts will be inspected regularly, and cleaned as necessary to provide for passage of design flows. Inlets and outlets shall also be maintained so as to prevent plugging or undue restriction of water flow.

All disturbed area culverts are temporary, and will be removed upon final reclamation.

2.10 Ditches

Ditches are shown on the Minesite Drainage Plan, Plate 2, and are designated with a D-number (i.e., D-2).

All ditches are designed to carry the expected runoff from a 10 year - 24 hour event with a minimum freeboard of 0.5' (See Figures 3 and 4). The 0.5' freeboard represents a minimum of 20% of the flow depth in all disturbed area ditches.

Ditches which exhibit expected flow velocities greater than 5 fps, based on the 10 year - 24 hour runoff, will be lined with rip-rap, belting or ½ round culvert for erosion protection. Typical cross-sections, flow depths and areas for all lined and unlined ditches are shown on Figures 3 and 4 of this report.

Ditch slopes have been determined from Plate 2

All ditches will be inspected regularly, and maintained to the minimum dimensions for the required 10 year - 24 hour runoff to provide adequate capacity for the design flow. All ditches are temporary and will be removed as described under the reclamation hydrology section. (Section 4)

2.11 Alternate Sediment Control Areas (ASCA)

There will be 5 Alternate Sediment Control Areas (ASCA) remaining on this site. The ASCA designations are ASCA-1, ASCA-2, ASCA-8, ASCA-9 and ASCA-10. Previous ASCA's 3, 4, 5, 6 and 7 have been eliminated either by site expansion, or because they are topsoil areas surrounded by berms but still capable of draining to sediment ponds. Only areas not able to be drained to sediment ponds are included as ASCA's.

The following are descriptions of each of the remaining ASCA's and methods of treatment:

ASCA-1 - This is the area west of the railroad right-of-way and scale house access road. The area is approximately 0.84 acres and is treated for sediment control by vegetation. This is an existing ASCA.

ASCA-2 - This is an existing ASCA area on the outslope east of Sediment Pond E. The area is approximately 0.26 acres and is treated by vegetation.

ASCA-8 - This will be a new ASCA located on the outslope of the new Sediment Pond G. It will have an area of approximately 1.16 acres and will be treated by vegetation.

ASCA-9 - This will be a new ASCA located on the outslope of the new Sediment Pond H. It will have an area of approximately 0.18 acres and will be treated by vegetation.

ASCA-10 - This will be a new ASCA located on the outslope of the new Sediment Pond I. It will have an area of approximately 1.18 acres and will be treated by vegetation.

2.12 Erosion Control

Wherever rip-rap is designated to be used, i.e. Culvert Outlets or Unlined Ditches, the following procedure shall be used:

- (1) Rip-rap will consist of hard, non-slaking angular, material;
- (2) Rip-rap shall meet the following size criteria:

Rip-Rap Sizing	Percent (+ or - 10%)
0.1 D_{50} - 0.5 D_{50}	20
0.5 D_{50} - 1.0 D_{50}	30
1.0 D_{50} - 2.0 D_{50}	50

- (3) Rip-rap shall be placed over a filter bedding consisting of -3/4" gravel and placed to a depth of at least the D_{50} of the rip-rap;
- (4) Rip-rap depth shall be at least 1.5 times the D_{50} of the material;
- (5) Belting, 1/2 round culvert, concrete lining or grouting of rip-rap may be used in lieu of the above procedures.

TABLE 1
DRAINAGE AREA DATA

Area	Acres	Hydraulic Length	High Elev.	Low Elev.	Change Elev.	Slope %	Runoff CN
DA-1	1.58	250	6198	6184	14	5.60	90
DA-2	1.01	100	6184	6180	4	4.00	90
DA-3	0.80	130	6178	6172	6	4.61	90
DA-4	1.26	230	6176	6170	6	2.61	90
DA-5	1.31	420	6176	6159	17	4.05	90
DA-6	3.09	550	6176	6142	34	6.18	90
DA-7	1.33	400	6164	6142	22	5.50	90
DA-8	3.80	700	6174	6141	33	4.71	90
DA-9	3.57	700	6174	6141	33	4.71	90
DA-10	5.45	400	6141	6124	17	4.25	90
DA-11	3.40	600	6196	6178	18	3.00	90
DA-12	0.42	480	6172	6172	2	0.50	90
DA-13	0.65	300	6174	6160	14	4.67	90
DA-14	0.76	600	6160	6156	4	0.67	90
DA-15	0.34	280	6168	6158	8	2.86	90
DA-16	3.05	640	6160	6138	22	3.44	90
DA-17	3.67	680	6160	6138	22	3.23	90
DA-18	5.04	480	6160	6134	26	5.42	90
DA-19	1.72	370	6188	6178	10	2.70	90
DA-20	2.48	250	6178	6158	20	8.00	90
DA-21	2.46	500	6162	6158	4	0.80	90
DA-22	5.65	730	6158	6129	29	3.97	90
DA-23	1.81	360	6150	6129	21	5.83	90
DA-24	7.48	1150	6178	6130	48	4.17	90
DA-25	1.40	190	6136	6126	10	5.26	90

Area	Acres	Hydraulic Length	High Elev.	Low Elev.	Change Elev.	Slope %	Runoff CN
DA-26	0.71	200	6136	6130	6	3.00	90
DA-27	1.15	440	6140	6130	10	2.27	90
DA-28	5.84	525	6130	6000	30	5.71	* 70
DA-29	1.47	350	6214	6196	18	5.14	90
DA-30	1.35	400	6216	6196	20	5.00	90
DA-31	1.79	1100	6200	6176	24	2.18	90
DA-32	2.23	1100	6200	6176	24	2.18	90
DA-33	6.43	600	6190	6180	10	1.67	90
DA-34	81.54	2900	6460	6200	260	8.97	65
DA-35	3.05	200	6286	6200	86	43.00	65
DA-36	2.18	820	6286	6180	106	12.93	65
DA-37	202.76	5600	6420	6130	290	5.18	65
DA-38	10.21	1150	6360	6235	125	10.87	65
DA-39	7.07	800	6260	6200	60	7.50	90
DA-40	1.76	35	6202	6192	10	28.57	90
ASCA-1	0.84	150	6188	6180	8	5.33	90
ASCA-2	0.26	230	6150	6140	10	4.35	90
ASCA-8	1.16	30	6128	6118	10	33.33	90
ASCA-9	0.18	30	6104	6094	10	33.33	90
ASCA-10	1.18	30	6122	6112	10	33.33	90

* Weighted

TABLE 2
RUNOFF SUMMARY

Drainage Area	10 yr - 6 hr 1.23"	10 yr - 24 hr 1.85"		25 yr - 6 hr 1.48"	100 yr - 6 hr 1.91"	Drains To:
	Peak Flow (cfs)	Peak Flow (cfs)	Runoff (ac.ft)	Peak Flow (cfs)	Peak Flow (cfs)	
DA-1	0.59	1.27	0.13	0.82	1.24	Pond E
DA-2	0.30	0.65	0.08	0.42	0.63	Pond E
DA-3	0.25	0.55	0.06	0.35	0.53	Pond E
DA-4	0.51	1.11	0.10	0.71	1.08	Pond E
DA-5	0.57	1.24	0.11	0.80	1.21	Pond E
DA-6	1.35	2.95	0.25	1.89	2.86	Pond E
DA-7	0.56	1.22	0.11	0.78	1.19	Pond E
DA-8	1.67	3.68	0.31	2.34	3.56	Pond I
DA-9	1.57	3.46	0.29	2.20	3.35	Pond I
DA-10	2.35	5.12	0.44	3.28	4.97	Pond I
DA-11	1.94	4.31	0.36	2.73	4.17	Pond C
DA-12	0.15	0.36	0.03	0.22	0.34	Pond C
DA-13	0.26	0.57	0.05	0.36	0.55	Pond C
DA-14	0.27	0.65	0.06	0.39	0.62	Pond C
DA-15	0.14	0.31	0.03	0.20	0.30	Pond C
DA-16	1.32	2.92	0.25	1.85	2.83	Pond C
DA-17	1.55	3.45	0.30	2.18	3.33	Pond C
DA-18	2.19	4.77	0.41	3.06	4.63	Pond C
DA-19	0.75	1.64	0.14	1.05	1.60	Pond G
DA-20	0.88	1.91	0.20	1.23	1.85	Pond G
DA-21	0.92	2.12	0.20	1.31	2.03	Pond G
DA-22	2.41	5.35	0.46	3.39	5.17	Pond G
DA-23	0.74	1.61	0.15	1.03	1.56	Pond G
DA-24	2.79	6.43	0.60	3.98	6.17	Pond G
DA-25	0.49	1.06	0.11	0.68	1.03	Pond G
DA-26	0.27	0.58	0.06	0.38	0.57	Pond H

Drainage Area	10 yr - 6 hr 1.23"	10 yr - 24 hr 1.85"		25 yr - 6 hr 1.48"	100 yr - 6 hr 1.91"	Drains To:
	Peak Flow (cfs)	Peak Flow (cfs)	Runoff (ac.ft)	Peak Flow (cfs)	Peak Flow (cfs)	
DA-27	0.51	1.12	0.09	0.72	1.09	Pond H
DA-28	0.09	0.89	0.09	0.16	0.64	Pond H
DA-29	0.61	1.32	0.12	0.85	1.28	Permanent Imp.
DA-30	0.57	1.25	0.11	0.8	1.21	Pond F
DA-31	0.64	1.52	0.14	0.93	1.45	Pond F
DA-32	0.80	1.90	0.18	1.16	1.81	Pond F
DA-33	2.56	5.81	0.52	3.64	5.59	Depression Area
DA-34	0.37	1.73	0.66	1.21	2.99	Permanent Imp.
DA-35	0.01	0.06	0.02	0.03	0.07	UD-8
DA-36	0.01	0.07	0.02	0.03	0.09	UD-2
DA-37	0.71	3.42	1.64	2.66	6.89	ND-1
DA-38	0.05	0.27	0.08	0.16	0.40	Pond F
DA-39	3.15	6.91	0.57	4.41	6.70	Pond F
DA-40	0.32	0.69	0.14	0.45	0.67	Pond F
ASCA-1	0.27	0.59	0.07	0.38	0.57	
ASCA-2	0.10	0.21	0.02	0.14	0.21	
ASCA-8	0.21	0.44	0.09	0.29	0.43	
ASCA-9	0.03	0.07	0.01	0.04	0.07	
ASCA-10	0.21	0.45	0.10	0.29	0.44	

TABLE 3
DRAINAGE STRUCTURES

Structure	Drainage From:	Remarks:
C-1	DA-36	Flows to UD-2
C-2	C-1	Flows to UD-2
C-3	C-2	Flows to UD-2
UD-2	C-3	Flows to Natural Drainage ND-1
C-4	UD-2	Flows to Natural Drainage ND-1
C-5	DA-37	Flows to Natural Drainage ND-1
C-6	DA-1	Drains to Pond E
D-1	C-6 + DA-2	Drains to Pond E
C-7	D-1	Drains to Pond E
C-8	C-7	Drains to Pond E
D-2	C-8	Drains to Pond E
C-9	D-2	Drains to Pond E
C-10	DA-3	Drains to Pond E
C-11	DA-4	Drains to Pond E
D-3	C-10, C-11	Drains to Pond E
C-13	DA-5	Drains to Pond E
D-4	C-9 + D-3	Drains to Pond E
C-12	D-4	Drains to Pond E
D-5	DA-5	Drains to Pond E
C-13	D-5	Drains to Pond E
D-6	C-12 + C13	Inlet to Pond E
D-7	DA-7	Inlet to Pond E
C-14	Pond E	Principle Outlet from Pond E
C-15	DA-29, DA-34, DA-35	Permanent Impoundment Principle Spillway
C-16	DA-29, DA-34, DA-35	Permanent Impoundment Emergency Spillway
D-8	DA-8	Drains to New Pond I
D-9	DA-9	Drains to New Pond I
C-17	DA-8 + DA-9	Drains to New Pond I
D-10	C-17 + DA-10	Inlet to Pond I

Structure	Drainage From:	Remarks:
C-18	DA-11	Flows to Pond C
D-11	C-18	Flows to Pond C
D-12	DA-12	Flows to Pond C
C-19	D-12	Flows to Pond C
D-13	C-19 + DA-13	Flows to Pond C
C-20	D-11 + D-13	Flows to Pond C
C-21	DA-14	Flows to Pond C
D-14	C-21	Flows to Pond C
C-22	D-14	Flows to Pond C
C-23	C-20 + C-22	Flows to Pond C
D-15	DA-15	Flows to Pond C
C-24	C-23 + D-15	Inlet to Pond C
C-25	DA-16	Flows to Pond C
D-16	C-25	Flows to Pond C
C-26	DA-17	Flows to Pond C
D-17	C-26	Flows to Pond C
C-27	D-16 + D-17	Flows to Pond C
C-28	DA-18	Flows to Pond C
D-18	C-28	Flows to Pond C
D-19	C-27 + D-18	Inlet to Pond C
C-29	Pond C	Principle Spillway Pond C
C-30	Pond C	Emergency Spillway Pond C
C-31	DA-19	Flows to New Pond G
D-20	$\frac{1}{2}$ DA-20	Flows to New Pond G
C-32	C-31 + D-20	Flows to New Pond G
D-21	C-32	Flows to New Pond G
D-22	$\frac{1}{2}$ DA-20	Flows to New Pond G
C-33	D-22	Flows to New Pond G
D-23	D-21 + C-33	Flows to New Pond G
C-34	D-22 + DA-21	Flows to New Pond G
D-24	$\frac{1}{4}$ DA-24	Flows to New Pond G

Structure	Drainage From:	Remarks:
C-35	D-24	Flows to New Pond G
D-25	DA-24	Inlet to New Pond G
D-26	C-34 + DA-22	Inlet to New Pond G
C-36	DA-23	Flows to New Pond G
D-27	C-36 + DA-25	Inlet to New Pond G
D-28	DA-26	Flows to New Pond H
C-37	DA-27	Flows to New Pond H
D-29	C-37	Flows to New Pond H
D-30	D-28 + D-29 + DA-28	Inlet to New Pond H
D-31	DA-29	Flows to Permanent Impoundment
D-32	DA-30	Flows to Pond F
D-33	DA-31	Flows to Pond F
C-40	D-36	Flows to Pond F
D-36	2/3 DA-38	Flows to Pond F
D-37	1/3 DA-38	Flows to Pond F
D-38	D-36 + D-37	Flows to Pond F
D-39	DA-39	Flows to Pond F
D-40	D-38 + D-39	Inlet to Pond F
D-34	D-32 + D-33	Inlet to Pond F
D-35	DA-32	Inlet to Pond F
C-38	Pond F	Principle Spillway from Pond F
C-39	D-3	Flows to Permanent Impoundment
UD-8	DA-35	Flows to Permanent Impoundment
Permanent Impoundment	DA-34 + UD-8	Flows to Depression Area
Depression Area	DA-33 + Permanent Impoundment	No Outlet

TABLE 4
DRAINAGE STRUCTURE FLOW SUMMARY

Area	10/6 cfs	10/24 cfs	25/6 cfs	100/6 cfs	Flows to:
D-1	0.89	1.92	1.24	1.87	Pond E
D-2	0.89	1.92	1.24	1.87	Pond E
D-3	0.76	1.66	1.06	1.61	Pond E
D-4	1.65	3.58	2.30	3.48	Pond E
D-5	0.57	1.24	0.80	1.21	Pond E
D-6	2.22	4.72	3.10	4.69	Inlet to Pond E
D-7	0.56	1.22	0.78	1.19	Inlet to Pond E
D-8	1.67	3.68	2.34	3.56	Pond I
D-9	1.57	3.46	2.20	3.35	Pond I
D-10	5.59	12.26	7.82	11.88	Inlet to Pond I
D-11	1.94	4.31	2.73	4.17	Pond C
D-12	0.15	0.36	0.22	0.34	Pond C
D-13	0.41	0.93	0.58	0.89	Pond C
D-14	0.27	0.65	0.39	0.62	Pond C
D-15	0.14	0.31	0.20	0.30	Pond C
D-16	1.32	2.92	1.85	2.83	Pond C
D-17	1.55	3.45	2.18	3.33	Pond C
D-18	2.19	4.77	3.06	4.63	Pond C
D-19	5.06	11.14	7.09	10.79	Inlet to Pond C
D-20	0.44	0.96	0.62	0.93	Pond G
D-21	1.19	2.60	1.85	2.78	Pond G
D-22	0.44	0.96	0.62	0.93	Pond G
D-23	2.63	3.56	2.47	3.71	Pond G
D-24	0.70	1.61	1.00	1.54	Pond G
D-25	2.79	6.43	3.98	6.17	Pond G
D-26	3.77	8.43	5.32	8.13	Inlet to Pond G
D-27	1.23	2.67	1.71	2.59	Inlet to Pond G
D-28	0.27	0.58	0.38	0.57	Pond H
D-29	0.51	1.12	0.72	1.09	Pond H

Area	10/6 cfs	10/24 cfs	25/6 cfs	100/6 cfs	Flows to:
D-30	0.87	2.59	1.26	2.30	Inlet to Pond H
D-31	0.61	1.37	0.85	1.28	To Permanent Impoundment
D-32	0.57	1.25	0.80	1.21	To Pond F
D-33	0.64	1.52	0.93	1.45	To Pond F
D-34	1.21	2.77	1.73	2.66	Inlet to Pond F
D-35	0.80	1.90	1.16	1.81	Inlet to Pond F
D-36	0.03	0.18	0.11	0.27	To Pond F
D-37	0.02	0.09	0.05	0.13	To Pond F
D-38	0.05	0.27	0.16	0.40	To Pond F
D-39	3.15	6.91	4.41	6.70	To Pond F
D-40	3.20	7.18	4.57	7.10	Inlet to Pond F
C-1	0.01	0.07	0.03	0.09	ND-1
C-2	0.01	0.07	0.03	0.09	ND-1
C-3	0.01	0.07	0.03	0.09	ND-1
C-4	0.01	0.07	0.03	0.09	ND-1
C-5	0.71	3.42	2.66	6.89	ND-1
C-6	0.59	1.27	0.82	1.24	Pond E
C-7	0.89	1.92	1.24	1.87	Pond E
C-8	0.89	1.92	1.24	1.87	Pond E
C-9	0.89	1.92	1.24	1.87	Pond E
C-10	0.25	0.55	0.35	0.53	Pond E
C-11	0.51	1.11	0.71	1.08	Pond E
C-12	1.65	3.58	2.30	3.48	Pond E
C-13	0.57	1.24	0.80	1.21	Pond E
C-14	2.78	5.94	3.88	5.88	Principle Spillway Outlet Pond E
C-15	0.99	3.11	2.09	4.34	Depression Area
C-16	0.99	3.11	2.09	4.34	Depression Area
C-17	3.24	7.14	4.54	7.91	Pond I
C-18	1.94	4.31	2.73	4.17	Pond C
C-19	0.15	0.36	0.22	0.34	Pond C

Area	10/6 cfs	10/24 cfs	25/6 cfs	100/6 cfs	Flows to:
C-20	2.35	5.24	3.31	5.06	Pond C
C-21	0.27	0.65	0.39	0.62	Pond C
C-22	0.27	0.65	0.39	0.62	Pond C
C-23	2.62	5.89	3.70	5.68	Pond C
C-24	2.76	6.20	4.00	5.98	Inlet to Pond C
C-25	1.32	2.92	1.85	2.83	Pond C
C-26	1.55	3.45	2.18	3.33	Pond C
C-27	2.87	6.37	4.03	6.16	Pond C
C-28	2.19	4.77	3.06	4.63	Pond C
C-29	7.82	17.34	11.09	16.77	Principle Spillway Outlet, Inlet to Pond C
C-30	7.82	17.34	11.09	16.77	Emergency Spillway Outlet, Inlet to Pond C
C-31	0.75	1.64	1.05	1.60	Pond G
C-32	1.19	2.60	1.67	2.53	Pond G
C-33	0.44	0.96	0.62	0.93	Pond G
C-34	1.36	3.08	1.93	2.96	Pond G
C-35	0.70	1.61	1.00	1.54	Pond G
C-36	0.74	1.61	1.03	1.56	Pond G
C-37	0.51	1.12	0.72	1.09	Pond H
C-38	5.21	11.85	7.46	11.57	Principle Spillway Outlet, Pond F
C-39	0.61	1.37	0.85	1.28	Permanent Impoundment
C-40	0.03	0.18	0.11	0.27	Pond F
UD-8	0.01	0.06	0.03	0.07	Permanent Impoundment
Permanent Impoundment	0.37	1.73	1.21	2.99	Permanent Impoundment
Depression Area	2.56	5.81	3.64	5.59	Depression Area
UD-2	0.01	0.07	0.03	0.09	ND-1
ASCA-1	0.27	0.59	0.38	0.57	ND-1

Area	10/6 cfs	10/24 cfs	25/6 cfs	100/6 cfs	Flows to:
ASCA-2	0.10	0.21	0.14	0.21	ND-1
ASCA-8	0.21	0.44	0.29	0.43	Berm/Pond G
ASCA-9	0.03	0.07	0.04	0.07	Berm/Pond H
ASCA-10	0.21	0.45	0.29	0.44	Berm/Pond I
ND-1	0.71	3.42	2.66	6.89	-

TABLE 5
DITCH DATA

Area ID	Hydraulic Length	High Elevation	Low Elevation	Change Elevation	Slope %	Manning's No.
D-1	50	6180	6178	2	4.0	0.035
D-2	150	6166	6164	2	1.3	0.035
D-3	595	6170	6162	8	1.3	0.035
D-4	90	6162	6160	2	2.2	0.035
D-5	170	6164	6158	6	3.5	0.035
D-6	150	6156	6144	12	8.0	0.035
D-7	150	6154	6144	10	6.7	0.035
D-8	540	6160	6142	18	3.3	0.035
D-9	580	6168	6142	26	4.5	0.035
D-10	430	6138	6126	12	2.8	0.035
D-11	620	6162	6156	6	1.0	0.035
D-12	460	6176	6172	4	0.9	0.035
D-13	150	6162	6158	4	2.7	0.035
D-14	410	6162	6158	4	1.0	0.035
D-15	190	6162	6156	6	3.2	0.035
D-16	170	6141	6138	3	1.8	0.035
D-17	90	6140	6138	2	2.2	0.035
D-18	130	6140	6136	4	3.1	0.035
D-19	95	6136	6128	8	8.4	0.035
D-20	470	6176	6166	10	2.1	0.035
D-21	120	6162	6160	2	1.7	0.035
D-22	220	6163	6160	3	1.4	0.035
D-23	260	6160	6157	3	1.2	0.035
D-24	130	6178	6176	2	1.5	0.035
D-25	1060	6152	6128	26	2.5	0.035

Area ID	Hydraulic Length	High Elevation	Low Elevation	Change Elevation	Slope %	Manning's No.
D-26	835	6158	6129	29	3.5	0.035
D-27	160	6136	6129	7	4.4	0.035
D-28	200	6136	6130	6	3.0	0.035
D-29	260	6138	6130	8	3.1	0.035
D-30	470	6130	6106	24	5.1	0.035
D-31	300	6211	6206	5	1.7	0.035
D-32	470	6211	6196	15	3.2	0.035
D-33	580	6102	6196	6	1.0	0.035
D-34	580	6196	6170	26	4.5	0.035
D-35	350	6181	6170	11	3.1	0.030
D-36	675	6228	6216	12	1.8	0.035
D-37	870	6280	6216	64	7.4	0.035
D-38	810	6216	6190	26	3.2	0.035
D-39	1050	6240	6190	50	4.8	0.035
D-40	180	6190	6180	10	5.6	0.035

TABLE 6
DITCH DESIGN SUMMARY

Ditch Structure	D-1	D-2	D-3	D-4	D-5
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	0.89	0.89	0.76	1.65	0.57
Velocity (fps)	2.72	1.79	1.72	2.54	2.32
Required Area (ft ²)	0.33	0.50	0.44	0.65	0.25
Flow Depth (ft.)	0.40	0.50	0.47	0.57	0.35
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	1.92	1.92	1.66	3.58	1.24
Velocity (fps)	3.30	2.17	2.09	3.08	2.81
Required Area (ft ²)	0.58	0.89	0.80	1.16	0.44
Flow Depth (ft.)	0.54	0.67	0.63	0.76	0.47
Construction					
Minimum Area (ft ²)	2.16	2.74	2.55	3.18	1.88
Minimum Depth (ft.)	1.04	1.17	1.13	1.26	0.97
*Erosion Protection	N	N	N	N	N
Type	-	-	-	-	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-6	D-7	D-8	D-9	D-10
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	2.22	0.56	1.67	1.57	5.59
Velocity (fps)	4.44	2.94	2.96	3.28	3.77
Required Area (ft ²)	0.50	0.19	0.56	0.48	1.48
Flow Depth (ft.)	0.50	0.31	0.53	0.49	0.86
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	4.72	1.22	3.68	3.46	12.26
Velocity (fps)	5.36	3.57	3.61	4.00	4.59
Required Area (ft ²)	0.88	0.34	1.02	0.87	2.67
Flow Depth (ft.)	0.66	0.41	0.71	0.66	1.16
Construction					
Minimum Area (ft ²)	2.69	1.66	2.93	2.69	5.51
Minimum Depth (ft.)	1.16	0.91	1.21	1.16	1.66
*Erosion Protection	Y	N	N	N	N
Type	½ Round Culvert	-	-	-	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-11	D-12	D-13	D-14	D-15
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	1.94	0.15	0.41	0.27	0.14
Velocity (fps)	1.97	1.00	1.94	1.20	1.58
Required Area (ft ²)	0.99	0.15	0.21	0.22	0.09
Flow Depth (ft.)	0.70	0.27	0.33	0.34	0.21
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	4.31	0.36	0.93	0.65	0.31
Velocity (fps)	2.40	1.24	2.38	1.50	1.50
1.92Required Area (ft ²)	1.79	0.29	0.39	0.43	0.16
Flow Depth (ft.)	0.95	0.38	0.44	0.47	0.28
Construction					
Minimum Area (ft ²)	4.20	1.55	1.77	1.88	1.22
Minimum Depth (ft.)	1.45	0.88	0.94	0.97	0.78
*Erosion Protection	N	N	N	N	N
Type	-	-	-	-	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-16	D-17	D-18	D-19	D-20
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	1.32	1.55	2.19	5.06	0.44
Velocity (fps)	2.23	2.50	3.10	5.55	1.79
Required Area (ft ²)	0.59	0.62	0.71	0.91	0.25
Flow Depth (ft.)	0.54	0.56	0.59	0.68	0.35
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	2.92	3.45	4.77	11.14	0.96
Velocity (fps)	2.72	3.05	3.76	6.76	2.18
Required Area (ft ²)	1.07	1.13	1.27	1.65	0.44
Flow Depth (ft.)	0.73	0.75	0.80	0.91	0.47
Construction					
Minimum Area (ft ²)	3.03	3.13	3.38	3.98	1.51
Minimum Depth (ft.)	1.23	1.25	1.30	1.41	0.87
*Erosion Protection	N	N	N	Y	N
Type	-	-	-	½ Round Culvert Belt	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-21	D-22	D-23	D-24	D-25
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	1.19	0.44	2.63	0.70	2.79
Velocity (fps)	2.12	1.54	2.27	1.77	3.04
Required Area (ft ²)	0.56	0.29	1.16	0.39	0.92
Flow Depth (ft.)	0.53	0.38	0.76	0.44	0.68
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	2.60	0.96	3.56	1.61	6.43
Velocity (fps)	2.58	1.87	2.45	2.18	3.74
Required Area (ft ²)	1.01	0.51	1.45	0.74	1.72
Flow Depth (ft.)	0.71	0.51	0.85	0.61	0.93
Construction					
Minimum Area (ft ²)	2.93	2.04	3.65	2.46	4.09
Minimum Depth (ft.)	1.21	1.01	1.35	1.11	1.43
*Erosion Protection	N	N	N	N	N
Type	-	-	-	-	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-26	D-27	D-28	D-29	D-30
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	3.77	1.23	0.27	0.51	0.87
Velocity (fps)	3.72	3.06	1.81	2.15	2.97
Required Area (ft ²)	0.01	0.40	0.15	0.24	0.29
Flow Depth (ft.)	0.71	0.45	0.27	0.34	0.38
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	8.43	2.67	0.58	1.12	2.59
Velocity (fps)	4.54	3.71	2.20	2.62	3.89
Required Area (ft ²)	1.86	0.72	0.26	0.43	0.66
Flow Depth (ft.)	0.96	0.60	0.36	0.46	0.58
Construction					
Minimum Area (ft ²)	4.26	2.42	1.48	1.84	2.33
Minimum Depth (ft.)	1.46	1.10	0.86	0.96	1.08
*Erosion Protection	N	N	N	N	N
Type	-	-	-	-	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-31	D-32	D-33	D-34	D-35
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	0.61	0.57	0.64	1.21	0.80
Velocity (fps)	1.80	2.24	1.49	3.07	2.41
Required Area (ft ²)	0.34	0.25	0.43	0.39	0.33
Flow Depth (ft.)	0.41	0.36	0.46	0.44	0.41
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	1.32	1.25	1.52	2.77	1.90
Velocity (fps)	2.18	2.73	1.85	3.78	2.99
Required Area (ft ²)	0.61	0.46	0.82	0.73	0.64
Flow Depth (ft.)	0.55	0.48	0.64	0.61	0.56
Construction					
Minimum Area (ft ²)	2.21	1.92	2.60	2.46	2.69
Minimum Depth (ft.)	1.05	0.98	1.14	1.11	1.16
*Erosion Protection	N	N	N	N	N
Type	-	-	-	-	-

* Based on 10 year - 24 hour flow.

TABLE 6 (Continued)
DITCH DESIGN SUMMARY

Ditch Structure	D-36	D-37	D-38	D-39	D-40
10 yr - 6 hr event (in.)	1.23	1.23	1.23	1.23	1.23
Peak Flow (cfs)	0.03	0.02	0.05	3.15	3.20
Velocity (fps)	0.86	1.33	1.22	4.00	4.25
Required Area (ft ²)	0.03	0.02	0.04	0.79	0.75
Flow Depth (ft.)	0.13	0.09	0.14	0.63	0.61
10 yr - 24 hr event (in.)	1.85	1.85	1.85	1.85	1.85
Peak Flow (cfs)	0.18	0.09	0.27	6.91	7.18
Velocity (fps)	1.35	1.93	1.86	4.87	5.21
Required Area (ft ²)	0.13	0.05	0.15	1.42	1.38
Flow Depth (ft.)	0.26	0.15	0.27	0.84	0.83
Construction					
Minimum Area (ft ²)	1.16	0.85	1.19	3.59	3.54
Minimum Depth (ft.)	0.76	0.65	0.77	1.34	1.33
*Erosion Protection	N	N	N	N	Y
Type	-	-	-	-	½ Round Culvert

* Based on 10 year - 24 hour flow.

TABLE 7
CULVERT DATA

Culvert ID	Length	Slope %	Manning's No.
C-1	30	3.0	0.020
C-2	40	5.0	0.020
C-3	70	2.9	0.020
C-4	50	8.0	0.020
C-5	120	3.3	0.020
C-6	40	7.5	0.020
C-7	70	2.9	0.020
C-8	60	3.3	0.020
C-9	80	2.5	0.020
C-10	20	3.0	0.020
C-11	20	3.0	0.020
C-12	40	3.3	0.020
C-13	80	3.8	0.020
C-14	40	10.0	0.020
C-15	40	3.0	0.020
C-16	40	3.0	0.020
C-17	80	5.0	0.020
C-18	90	3.0	0.020
C-19	40	15.0	0.020
C-20	40	3.3	0.020
C-21	100	1.0	0.020
C-22	90	2.0	0.020
C-23	50	4.0	0.020
C-24	400	6.0	0.020
C-25	30	13.3	0.020
C-26	40	7.5	0.020

Culvert ID	Length	Slope %	Manning's No.
C-27	50	3.0	0.020
C-28	50	8.0	0.020
C-29	60	3.0	0.020
C-30	60	3.0	0.020
C-31	90	3.0	0.020
C-32	20	3.0	0.020
C-33	30	3.5	0.020
C-34	130	3.8	0.020
C-35	45	20.0	0.020
C-36	30	3.0	0.020
C-37	30	8.0	0.020
C-38	40	3.3	0.020
C-39	40	3.0	0.020
C-40	40	2.5	0.020

TABLE 8
CULVERT DESIGN SUMMARY

Culvert	10 yr - 6 hr Event 1.23"			10 yr - 24 hr Event 1.85"			Actual Construction Diameter (ft.)	Flow Capacity (cfs)	Erosion Protection at Outlet Required Y/N	Type of Erosion Protection
	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.				
C-1	0.01	1.14	0.11	0.07	1.86	0.22	1.0	4.01	N	-
C-2	0.01	1.38	0.10	0.07	2.25	0.20	1.0	5.18	N	-
C-3	0.01	1.13	0.11	0.07	1.83	0.22	2.0	25.04	N	-
C-4	0.01	1.65	0.09	0.07	2.68	0.18	2.0	41.59	N	-
C-5	0.71	3.43	0.51	3.42	5.09	0.93	3.0	78.76	Y	Natural
C-6	0.59	4.46	0.41	1.27	5.40	0.55	1.25	11.50	Y	6" D ⁵⁰ Rip-Rap
C-7	0.89	3.46	0.57	1.92	4.19	0.76	1.25	25.04	N	1.20
C-8	0.89	3.63	0.56	1.92	4.40	0.75	2.0	26.71	N	0.75
C-9	0.89	3.27	0.59	1.92	3.97	0.78	1.5	10.80	N	1.00
C-10	0.25	2.55	0.35	0.55	3.11	0.47	1.0	4.01	N	1.00
C-11	0.51	3.05	0.46	1.11	3.70	0.62	1.0	4.01	N	0.50
C-12	1.65	4.24	0.70	3.58	5.14	0.94	1.5	11.83	Y	½ Round Culvert
C-13	0.57	3.43	0.46	1.24	4.16	0.62	1.0	4.51	N	0.50
C-14	2.78	7.32	0.70	5.94	8.85	0.92	1.5	21.59	Y	9" D ⁵⁰ Rip-Rap
C-15	0.37	2.81	0.41	1.73	4.14	0.73	1.5	11.83	N	-
C-16	0.37	2.81	0.41	1.73	4.14	0.73	1.5	11.83	N	-
C-17	3.24	5.86	0.84	7.14	7.14	1.13	*2.0	32.88	Y	9" D ⁵⁰ Rip-Rap or Belting

Culvert	10 yr - 6 hr Event 1.23"			10 yr - 24 hr Event 1.85"			Actual Construction Diameter (ft.)	Flow Capacity (cfs)	Erosion Protection at Outlet Required Y/N	Type of Erosion Protection
	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.				
C-18	1.94	4.26	0.76	4.31	5.20	1.03	1.25	7.27	Y	6" D ⁵⁰ Rip-Rap
C-19	0.15	4.11	0.22	0.36	5.11	0.30	2.0	56.95	Y	6" D ⁵⁰ Rip-Rap
C-20	2.35	4.63	0.80	5.24	5.66	1.09	2.0	26.71	Y	Drop Inlet
C-21	0.27	1.72	0.45	0.65	2.15	0.62	1.0	2.32	N	-
C-22	0.27	2.23	0.39	0.65	2.78	0.55	1.0	3.28	N	-
C-23	2.62	5.11	0.81	5.89	6.26	1.09	2.0	29.41	Y	Drop Inlet
C-24	2.76	6.03	0.76	6.20	7.38	1.03	2.0	36.02	Y	Belting Pond Inlet
C-25	1.32	6.76	0.50	2.92	8.25	0.67	1.0	8.45	Y	6" D ⁵⁰ Rip-Rap
C-26	1.55	5.68	0.59	3.45	6.93	0.80	1.0	6.34	Y	6" D ⁵⁰ Rip-Rap
C-27	2.87	4.70	0.88	6.37	5.73	1.19	1.5	11.83	Y	½ Round Culvert
C-28	2.19	6.34	0.66	4.77	7.70	0.89	1.0	6.55	Y	6" D ⁵⁰ Rip-Rap
C-29	7.82	6.03	1.28	17.34	7.36	1.73	1.5	11.83	Y	9" D ⁵⁰ Rip-Rap
C-30	7.82	6.03	1.28	17.34	7.36	1.73	1.5	11.83	Y	9" D ⁵⁰ Rip-Rap
C-31	0.75	3.36	0.53	1.64	4.08	0.72	1.25	7.27	N	-
C-32	1.19	3.77	0.63	2.60	4.58	0.85	1.0	4.01	N	-
C-33	0.44	3.11	0.42	0.96	3.78	0.57	1.0	4.33	N	-
C-34	1.36	4.26	0.64	3.08	5.22	0.87	1.25	8.19	Y	Belting
C-35	0.70	6.72	0.36	1.61	8.28	0.50	1.0	10.36	Y	6" D ⁵⁰ Rip-Rap
C-36	0.74	3.35	0.53	1.61	4.07	0.71	1.0	4.01	N	-

Culvert	10 yr - 6 hr Event 1.23"			10 yr - 24 hr Event 1.85"			Actual Construction Diameter (ft.)	Flow Capacity (cfs)	Erosion Protection at Outlet Required Y/N	Type of Erosion Protection
	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.				
C-37	0.51	4.41	0.38	1.12	5.36	0.52	*1.0	6.55	Y	6" D ⁵⁰ Rip-Rap
C-38	5.21	5.65	1.08	11.85	6.94	1.47	*1.5	12.40	Y	Belting
C-39	0.61	3.19	0.49	1.37	3.90	0.67	*1.25	25.47	N	-
C-40	0.03	1.40	0.17	0.18	2.20	0.32	*2.0	23.25	N	-

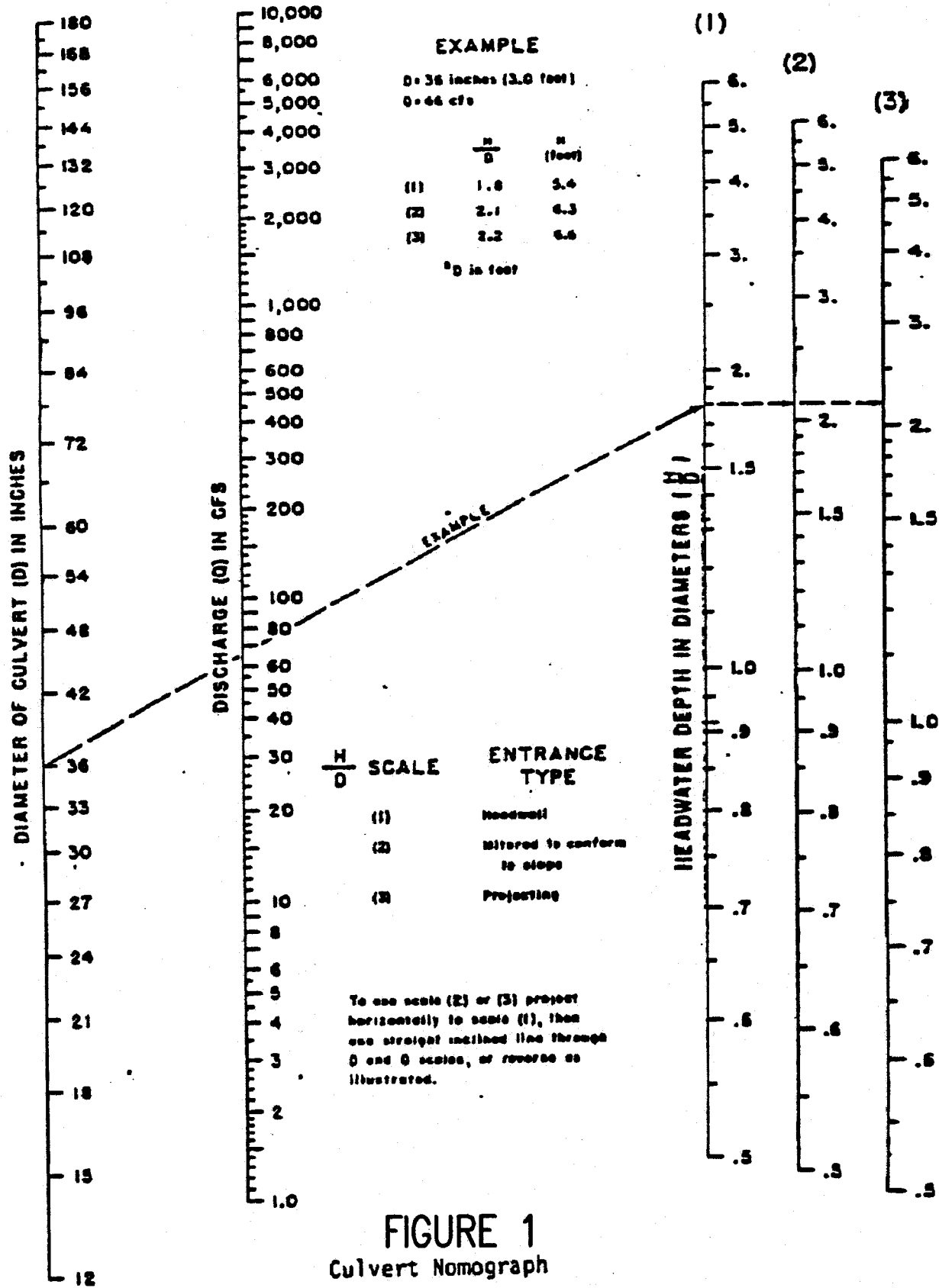
* Proposed

FIGURES

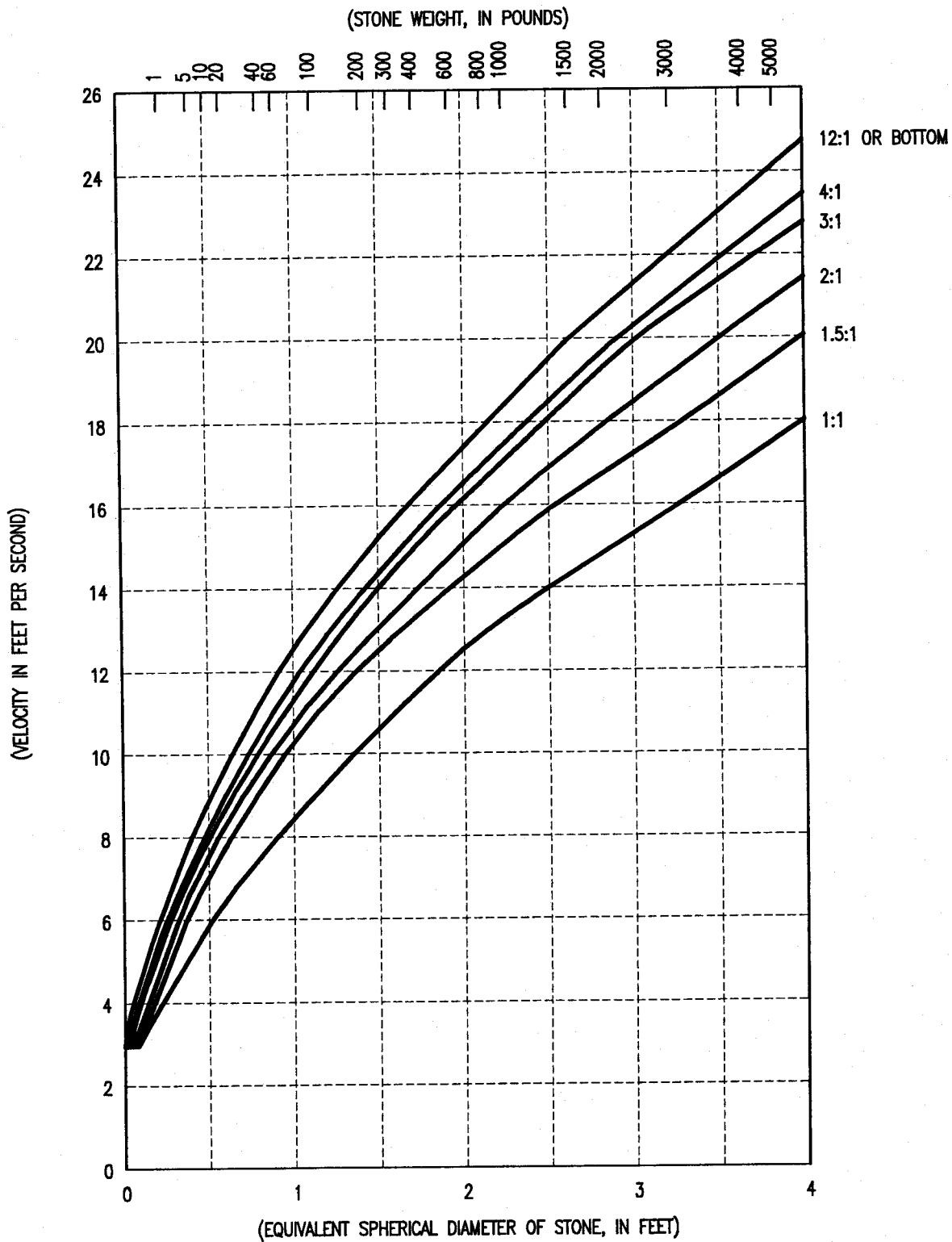
Figure 1 **Culvert Nomograph**

Figure 2 **Rip-Rap Chart**

Figure 3 **Undisturbed and Disturbed Ditch, Typical Section**



RIP-RAP CHART



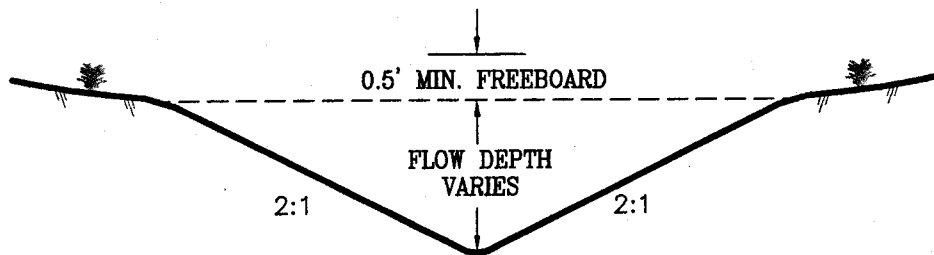
SIZE OF STONE THAT WILL RESIST DISPLACEMENT FOR VARIOUS VELOCITIES AND SIDE SLOPES

NOTE:

ADAPTED FROM REPORT OF SUBCOMMITTEE ON SLOPE PROTECTION, AM. SOC. CIVIL ENGINEERS PROC. JUNE 1948.
FOR STONE WEIGHING 165 LBS. PER CUBIC FEET.

Figure 2

UNDISTURBED AND DISTURBED DITCH
TYPICAL SECTION



Note: Flows based on a 10 year – 24 hour event.

- * Used for calculation only. Side slopes may vary; however, minimum flow area will be maintained.*



FIGURE 3

DESIGN OF SEDIMENT CONTROL STRUCTURES

Design of Sediment Control Structures

3.1 Design and Construction Specifications for Sedimentation Pond

3.2 Sediment Yield

3.3 Sediment Pond Volume

Table 9	Sediment Pond "C" Design
Table 10	Sediment Pond "E" Design
Table 11	Sediment Pond "F" Design
Table 12	Sediment Pond "G" Design
Table 13	Sediment Pond "H" Design
Table 14	Sediment Pond "I" Design
Table 15	Permanent Impoundment Design
Table 16	Depression Area Design
Table 17	Sediment Pond "C" Stage Volume Data (As-Constructed)
Table 18	Sediment Pond "E" Stage Volume Data (Proposed)
Table 19	Sediment Pond "F" Stage Volume Data (Proposed)
Table 20	Sediment Pond "G" Stage Volume Data (Proposed)
Table 21	Sediment Pond "H" Stage Volume Data (Proposed)
Table 22	Sediment Pond "I" Stage Volume Data (Proposed)
Table 23	Permanent Impoundment Stage Volume Data (As-Constructed)
Table 24	Depression Area Stage Volume Data (As-Constructed)
Table 25	Impoundment Discharge Data
Table 26	Sediment Ponds E and F Open-Channel Spillway Stage Discharge Data

3.4 Sediment Pond Summary

3.1 Design and Construction Specifications for Sedimentation Pond

- a) All construction of sedimentation ponds will be performed under the direction of a qualified, registered professional engineer.**
- b) Sediment Pond C, Permanent Impoundment and the Depression Area are all existing impoundments, with no changes proposed. Sediment Ponds E and F are also existing; however, due to site modifications, each of these ponds will be enlarged. The pond dams and overflows will not be modified. Each pond has a cmp principal overflow (18" for E and 12" for F), and an open-channel emergency spillway. Existing ponds A, B and D will be eliminated and replaced with new ponds G, H, and I. Each of the new ponds will be equipped with a cmp principal overflow (G-18", H-12" and I-18"), and an emergency cmp (same sizes) overflow. The emergency overflows will be at least 1.0' above the primary overflows, and at least 2.0' below the top of the dam.**
- c) The area of pond construction shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.**
- d) In areas where fill is to be placed for the pond impoundment structures, natural ground shall be removed for at least 12" below the base of the structure.**
- e) Native materials shall be used where practical. Fill will be placed in lifts not to exceed 15" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.**
- f) Rip-rap or other protection (culverts, concrete, etc.) will be placed at all inlets and outlets to prevent scouring. Rip-rap will consist of substantial (non-slaking) rock material of adequate size.**

- g) Decanting of the ponds, as required, will be accomplished by use of a portable pump with an inverted inlet, and a pumping capacity of 100 gpm or greater. Samples will be collected prior to decanting of the pond. If the quality of the water meets the requirements of the U.P.D.E.S. Permit, decanting will proceed. Discharge samples will be collected as per the approved U.P.D.E.S. Discharge Permit.**
- h) Slopes of the embankments shall not be steeper than 2h : 1v, inside or outside, with a total of the inslope and outslope not less than 5h : 1v, except where areas of the pond are incised.**
- i) Tops and external slopes of the impoundments will be planted with an approved seed mix to help prevent erosion and promote stability.**
- j) Top width of the embankments shall be not less than $(H+35)/5$, where H = Height of Dam in feet.**

3.2 Sediment Yield

The Universal Soil Loss Equation (USLE) was used to estimate sediment yield from drainage areas. All soil loss from this area was assumed to be delivered to, and deposited in the respective sedimentation pond.

Erosion rate (A) in tons-per-acre-per-year is determined using the USLE as follows:

$$A = (R) (K) (LS) (CP)$$

where the variables R, K, LS, and CP are defined as follows:

Variable "R" is the rainfall factor which can be estimated from $R = 27P^{2.2}$; where P is the 2-year, 6-hour precipitation value. P for the Gordon Creek area is 0.85" as shown in Section 2.1. Therefore, the estimated value of "R" for this area is 18.88.

Variable "K" is the soil erodibility factor. For disturbed areas, the "K" value is conservatively estimated to be 0.5. "K" is estimated to be 0.035 for undisturbed areas.

Variable "LS" is the length-slope factor. This figure was determined by applying the slope length and percentage for each sub-drainage area to the chart in Figure 5.15, p. 334, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983.

Variable "CP" is the control practice factor, which can be divided into a cover and a practice factor. For purposes of these calculations, the following "CP" values were used:

<u>Site</u>	<u>CP Factor</u>
Disturbed Areas	1.20
Undisturbed Areas	0.15

The sediment volume is based on a density of 100 pounds per cubic foot of sediment.

Sediment Yield Calculations - USLE

Drainage	To:	R	K	Acres	Slope Length Feet	Slope (%)	LS	CP	A*	Yield**
DA-1	Pond E	18.88	0.5	1.58	250	5.60	0.95	1.20	10.76	0.008
DA-2	Pond E	18.88	0.5	1.01	100	4.00	0.40	1.20	4.53	0.002
DA-3	Pond E	18.88	0.5	0.80	130	4.61	0.52	1.20	5.98	0.002
DA-4	Pond E	18.88	0.5	1.26	230	2.61	0.32	1.20	3.62	0.002
DA-5	Pond E	18.88	0.5	1.31	420	4.05	0.75	1.20	8.50	0.005
DA-6	Pond E	18.88	0.5	3.09	550	6.18	1.70	1.20	19.26	0.027
DA-7	Pond E	18.88	0.5	1.33	400	5.50	1.15	1.20	13.03	0.008
DA-8	Pond I	18.88	0.5	3.80	700	4.71	1.20	1.20	13.59	0.024
DA-9	Pond I	18.88	0.5	3.57	700	4.71	1.20	1.20	13.59	0.022
DA-10	Pond I	18.88	0.5	5.45	400	4.25	0.75	1.20	8.50	0.021
DA-11	Pond C	18.88	0.5	4.50	600	3.00	0.50	1.20	5.66	0.012
DA-12	Pond C	18.88	0.5	0.42	480	0.50	0.16	1.20	1.81	0.001
DA-13	Pond C	18.88	0.5	0.65	300	4.67	0.75	1.20	8.50	0.003
DA-14	Pond C	18.88	0.5	0.76	600	0.67	0.18	1.20	2.04	0.001
DA-15	Pond C	18.88	0.5	0.34	280	2.86	0.37	1.20	4.19	0.001
DA-16	Pond C	18.88	0.5	3.05	640	3.44	0.63	1.20	7.14	0.010
DA-17	Pond C	18.88	0.5	3.67	68	3.23	0.54	1.20	6.12	0.010
DA-18	Pond C	18.88	0.5	5.04	480	5.42	1.25	1.20	14.16	0.033
DA-19	Pond G	18.88	0.5	1.72	370	2.70	0.38	1.20	4.30	0.002
DA-20	Pond G	18.88	0.5	2.48	250	8.00	1.55	1.20	17.56	0.020
DA-21	Pond G	18.88	0.5	2.46	500	0.80	0.18	1.20	2.04	0.002
DA-22	Pond G	18.88	0.5	5.65	730	3.97	0.88	1.20	9.97	0.026
DA-23	Pond G	18.88	0.5	1.81	360	5.83	1.20	1.20	13.59	0.011
DA-24	Pond G	18.88	0.5	7.48	1150	4.17	1.10	1.20	12.46	0.043
DA-25	Pond G	18.88	0.5	1.40	190	5.26	0.80	1.20	9.06	0.006
DA-26	Pond H	18.88	0.5	0.71	200	3.00	0.35	1.20	3.96	0.001
DA-27	Pond H	18.88	0.5	1.15	440	2.27	0.34	1.20	3.85	0.002
DA-28	Pond H	18.88	0.035	5.84	525	5.71	1.35	0.15	0.13	0.001
DA-30	Pond F	18.88	0.5	1.35	400	5.00	1.05	1.20	11.89	0.007

Drainage	To:	R	K	Acres	Slope Length Feet	Slope (%)	LS	CP	A*	Yield**
DA-31	Pond F	18.88	0.5	1.79	1100	2.18	0.44	1.20	4.98	0.004
DA-32	Pond F	18.88	0.5	2.23	1100	2.18	0.44	1.20	4.98	0.005
DA-38	Pond F	18.88	0.035	10.21	1150	10.87	5.20	0.15	0.52	0.002
DA-39	Pond F	18.88	0.5	7.07	800	7.50	2.50	1.20	28.32	0.092

***DA-40

* A = tons/acre-year

** Yield = acre-ft/year

*** Bermed Topsoil Pile - No Flow to Pond

	Pond C	Pond E	Pond F	Pond G	Pond H	Pond I
Total Sediment - 1 yr. (ac. ft.)	0.071	0.054	0.110	0.110	0.004	0.067
Total Sediment - 3 yr. (ac. ft.)	0.213	0.162	0.330	0.330	0.012	0.201

3.3 Sediment Pond Volume

The volumes shown in Tables 9 through 14 are from the volumes calculated from the precipitation , runoff and sediment yield for a 10 year - 24 hour precipitation event. The volumes were calculated based on the disturbed areas (and contributing undisturbed areas) runoff values, developed using the design parameters described in this section.

TABLE 9
SEDIMENT POND "C" DESIGN

1-	Use 1.85" for 10 year - 24 hour event.		
2-	Disturbed Area Draining to Pond = 18.43 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)	=	<u>1.490 ac.ft.</u>
5-	Sediment Storage Volume USLE - 0.213	=	<u>0.213 ac.ft.</u>
6-	Direct Precipitation into Pond 0.86 acres x 1.85" / 12 in./ft.	=	<u>0.133 ac.ft.</u>
7-	Total Required Pond Volume 1.490 + 0.213 + 0.133	=	<u>1.836 ac.ft.</u>
*8-	Pond Actual Volume at Principal Spillway	=	<u>4.732 ac.ft.</u>
9-	Peak Flow (25 year - 6 hour event)	=	<u>10.99 cfs</u>

* Existing.

TABLE 10
SEDIMENT POND "E" DESIGN

1-	Use 1.85" for 10 year - 24 hour event.		
2-	Disturbed Area Draining to Pond = 10.38 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)	=	<u>0.840 ac.ft.</u>
5-	Sediment Storage Volume USLE - 0.162	=	<u>0.162 ac.ft.</u>
6-	Direct Precipitation into Pond 0.17 acres x 1.85" / 12 in./ft.	=	<u>0.026 ac.ft.</u>
7-	Total Required Pond Volume 0.840 + 0.162 + 0.026	=	<u>1.028 ac.ft.</u>
*8-	Pond Volume at Principal Spillway	=	<u>1.256 ac.ft.</u>
9-	Peak Flow (25 year - 6 hour event)	=	<u>5.77 cfs</u>

* After proposed enlargement.

TABLE 11
SEDIMENT POND "F" DESIGN

1-	Use 1.85" for 10 year - 24 hour event.		
2-	Disturbed Area Draining to Pond = 12.44 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)	=	<u>1.000 ac.ft.</u>
5-	Undisturbed Watershed = 10.21 Acres		
6-	Runoff Curve Number - 65		
7-	Undisturbed Area Runoff (From Table 4, 10 yr/24 hr)	=	<u>0.080 ac.ft.</u>
8-	Sediment Storage Volume USLE - 0.330	=	<u>0.33 ac.ft.</u>
9-	Direct Precipitation into Pond 0.40 acres x 1.85" / 12 in./ft.	=	<u>0.062 ac.ft.</u>
10-	Total Required Pond Volume 1.000 + 0.080 + 0.330 + 0.062	=	<u>1.472 ac.ft.</u>
*11-	Pond Volume at Principal Spillway	=	<u>1.897 ac.ft.</u>
12-	Peak Flow (25 year - 6 hour event)	=	<u>7.46 cfs</u>

* After proposed enlargement.

TABLE 12
SEDIMENT POND "G" DESIGN

1-	Use 1.85" for 10 year - 24 hour event.		
2-	Disturbed Area Draining to Pond = 23.00 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)	=	<u>1.860 ac.ft.</u>
5-	Sediment Storage Volume USLE - 0.330	=	<u>0.330 ac.ft.</u>
6-	Direct Precipitation into Pond 1.10 acres x 1.85" / 12 in./ft.	=	<u>0.170 ac.ft.</u>
7-	Total Required Pond Volume 1.860 + 0.330 + 0.170	=	<u>2.360 ac.ft.</u>
*8-	Pond Volume at Principal Spillway	=	<u>4.464 ac.ft.</u>
9-	Peak Flow (25 year - 6 hour event)	=	<u>12.67 cfs</u>

* Proposed.

TABLE 13
SEDIMENT POND "H" DESIGN

1-	Use 1.85" for 10 year - 24 hour event.		
2-	Disturbed Area Draining to Pond = 1.86 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)	=	<u>0.150 ac.ft.</u>
5-	Undisturbed Watershed = 5.84 Acres		
6-	Weighted Runoff Curve Number - 70		
7-	Undisturbed Area Runoff (From Table 4, 10 yr/24 hr)	=	<u>0.090 ac.ft.</u>
8-	Sediment Storage Volume USLE - 0.012	=	<u>0.012 ac.ft.</u>
9-	Direct Precipitation into Pond 0.22 acres x 1.85" / 12 in./ft.	=	<u>0.034 ac.ft.</u>
10-	Total Required Pond Volume 0.150 + 0.090 + 0.012 + 0.034	=	<u>0.286 ac.ft.</u>
*11-	Pond Volume at Principal Spillway	=	<u>0.595 ac.ft.</u>
12-	Peak Flow (25 year - 6 hour event)	=	<u>1.26 cfs</u>

* Proposed.

TABLE 14
SEDIMENT POND "I" DESIGN

1-	Use 1.85" for 10 year - 24 hour event.		
2-	Disturbed Area Draining to Pond = 12.82 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 9, 10 yr./24 hr.)	=	<u>1.040 ac.ft.</u>
5-	Runoff from Pond C	=	<u>1.836 ac.ft.</u>
*6-	Sediment Storage Volume USLE - 0.201	=	<u>0.201 ac.ft.</u>
7-	Direct Precipitation into Pond 1.43 acres x 1.85" / 12 in./ft.	=	<u>0.220 ac.ft.</u>
8-	Total Required Pond Volume 1.040 + 1.836 + 0.201 + 0.220	=	<u>3.297 ac.ft.</u>
**9-	Pond Volume at Principal Spillway	=	<u>9.832 ac.ft.</u>
***10-	Peak Flow (25 year - 6 hour event) (7.82 cfs + 10.99 cfs)	=	<u>18.81 cfs</u>

* Does not include Pond C Sediment.

** Proposed.

*** Includes Pond C Peak Flow.

TABLE 15
PERMANENT IMPOUNDMENT DESIGN

1-	Use 1.91" for 100 year - 6 hour event.		
2-	Disturbed Area Draining to Pond = 1.47 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 100 yr./6 hr.)	=	<u>0.120 ac.ft.</u>
5-	Undisturbed Watershed = 84.59 Acres		
6-	Weighted Runoff Curve Number - 65		
7-	Undisturbed Area Runoff (From Table 2, 100 yr/6 hr)	=	<u>0.790 ac.ft.</u>
8-	Direct Precipitation into Pond 0.76 acres x 1.91" / 12 in./ft.	=	<u>0.121 ac.ft.</u>
9-	Total Required Pond Volume 0.120 + 0.790 + 0.121	=	<u>1.031 ac.ft.</u>
*10-	Pond Actual Volume	=	<u>1.114 ac.ft.</u>
11-	Peak Flow (100 year - 6 hour event)	=	<u>4.34 cfs</u>

* Existing.

TABLE 16
DEPRESSION AREA DESIGN

1-	Use 1.91" for 100 year - 6 hour event.		
2-	Disturbed Area Draining to Pond = 6.43 acres.		
3-	Runoff Curve Number = CN = 90 (Disturbed)		
4-	Disturbed Area Runoff = (From Table 2, 100 yr./6 hr.)	=	<u>0.550 ac.ft.</u>
5-	Runoff from Permanent Impoundment	=	<u>1.031 ac.ft.</u>
6-	Direct Precipitation into Area 6.43 acres x 1.91" / 12 in./ft.	=	<u>1.023 ac.ft.</u>
7-	Total Required Volume 0.550 + 1.031 + 1.023	=	<u>2.604 ac.ft.</u>
*8-	Actual Volume	=	<u>4.990 ac.ft.</u>

* Existing.

TABLE 17
SEDIMENT POND "C"
STAGE VOLUME DATA (AS-CONSTRUCTED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6127.7	804.3	0	0	Bottom of Pond
6130.0	18,075.7	0.498	0.498	
6131.5	-	0.700	1.198	Sediment Cleanout Level
6132.0	22,596.8	0.234	1.432	
6134.0	27,274.0	1.145	2.577	
6136.0	32,557.0	1.374	3.951	
6137.0	35,481.1	0.781	4.732	Principal Spillway
6138.0	38,405.1	0.848	5.580	Emergency Spillway
6140.0	45,286.6	1.921	7.501	Crest of Dam

TABLE 18
SEDIMENT POND "E"
STAGE VOLUME DATA (PROPOSED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6138.0	5,240.5	0	0	Bottom of Pond
6139.5	-	0.201	0.201	Sediment Cleanout Level
6140.0	6,427.5	0.067	0.268	
6142.0	7,720.3	0.325	0.593	
6144.0	10,256.0	0.413	1.006	
6145.0	11,552.2	0.250	1.256	Principal Spillway
6146.0	12,848.3	0.280	1.536	Emergency Spillway
6148.0	15,515.4	0.651	2.187	Crest of Dam

TABLE 19
SEDIMENT POND "F"
STAGE VOLUME DATA (PROPOSED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6166.0	9,121.2	0	0	Bottom of Pond
6168.0	10,585.7	0.452	0.452	Sediment Cleanout Level
6170.0	12,150.7	0.522	0.974	
6172.0	13,816.2	0.596	1.570	
6173.0	14,699.3	0.327	1.897	Principal Spillway
6174.0	15,582.3	0.348	2.245	Emergency Spillway
6176.0	17,448.9	0.758	3.003	Crest of Dam

TABLE 20
SEDIMENT POND "G"
STAGE VOLUME DATA (PROPOSED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6120.0	35,061.0	0	0	Bottom of Pond
6121.2	36,874.0	0.991	0.991	60% Sediment Cleanout Level
6122.0	38,082.0	0.688	1.679	Maximum Sediment Level
6124.0	41,216.0	1.820	3.499	
6125.0	42,839.0	0.965	4.464	Principal Spillway
6126.0	44,461.0	1.002	5.466	Emergency Spillway
6128.0	47,818.0	2.118	7.584	Crest of Dam

TABLE 21
SEDIMENT POND "H"
STAGE VOLUME DATA (PROPOSED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6096.0	3,565.0	0	0	Bottom of Pond
6197.2	4,304.0	0.108	0.108	60% Cleanout Level
6098.0	4,796.0	0.084	0.192	Maximum Sediment Level
6100.0	6,197.0	0.252	0.444	
6101.0	6,970.0	0.151	0.595	Principal Spillway
6102.0	7,743.0	0.169	0.764	Emergency Spillway
6104.0	9,424.0	0.394	1.158	Crest of Dam

TABLE 22
SEDIMENT POND "I"
STAGE VOLUME DATA (PROPOSED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6110.0	39,947.0	0	0	Bottom of Pond
6111.8	43,039.0	1.715	1.715	60% Sediment Cleanout Level
6112.0	43,383.0	0.198	1.913	
6113.0	45,153.0	1.016	2.929	Maximum Sediment Level
6114.0	46,922.0	1.057	3.986	
6116.0	50,566.0	2.169	6.155	
6118.0	54,313.0	2.408	8.563	
6119.0	56,239.0	1.269	9.832	Principal Spillway
6120.0	58,164.0	1.313	11.145	Emergency Spillway
6122.0	62,381.0	2.767	13.912	Crest of Dam

TABLE 23
PERMANENT IMPOUNDMENT
STAGE VOLUME DATA (AS-CONSTRUCTED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6192.0	571.8	0	0	Bottom of Upper Cell
6194.0	5,714.4	0.144	0.144	
6195.8	8,472.6	0.293	0.437	Principal Spillway
6196.3	9,238.7	0.102	0.539	Emergency Spillway
6183.5	9,148.3	0.000	0.437	Bottom of Lower Cell
6185.8	16,486.7	0.677	1.114	Overflow - Lower Cell

TABLE 24
DEPRESSION AREA
STAGE VOLUME DATA (AS-CONSTRUCTED)

Elevation	Area (ft²)	Volume (ac. ft.)	Acc. Volume (ac. ft.)	Remarks
6172.0	16,674.8	0	0	Bottom
6174.0	33,854.8	1.160	1.160	
6176.0	132,985.0	3.830	4.990	Maximum Water Level
6178.0	152,100.6	6.544	11.534	Track Level

TABLE 25
IMPOUNDMENT
DISCHARGE DATA

IMPOUNDMENT POND	SPILLWAY	TYPE SIZE	25/6 FLOW (cfs)	FLOW DEPTH (ft)	REMARKS
C	Principal	18" cmp	10.99	1.14(76% full)	Existing
C	Emergency	18" cmp	10.99	1.14(76% full)	Existing
E	Principal	18" cmp	5.77	0.74 (49% full)	Existing
E	Emergency	Open Channel	5.77	0.47	Existing
F	Principal	18" cmp	7.46	0.86 (58% full)	Proposed
F	Emergency	Open Channel	7.46	0.55	Existing
G	Principal	24" cmp	12.67	1.00 (50% full)	Proposed
G	Emergency	24" cmp	12.67	1.00 (50% full)	Proposed
H	Principal	12" cmp	1.26	0.33 (22% full)	Proposed
H	Emergency	12" cmp	1.26	0.33 (22% full)	Proposed
I	Principal	24" cmp	18.81	1.28 (64% full)	Proposed
I	Emergency	24" cmp	18.81	1.28 (64% full)	Proposed
PI	Principal	18" cmp	4.34	0.63 (42% full)	Existing
PI	Emergency	18" cmp	4.34	0.63 (42% full)	Existing

Notes:

- 1) Culverts are calculated on 3 % slope.
- 2) Open-Channel spillways are 5' wide x 1' deep with 2:1 side slopes. (See Table 26)
- 3) Depression Area has no overflow.

TABLE 26
SEDIMENT PONDS E AND F
OPEN-CHANNEL SPILLWAY
STAGE DISCHARGE DATA

STAGE (ft.)	DISCHARGE (cfs)
0.00	0.00
0.20	1.49
0.40	4.53
0.47	*5.91
0.55	**7.68
0.60	8.90
0.80	14.58
1.00	21.61

Notes: * 25 year - 6 hour Peak Flow from Pond E = 5.77 cfs.
Flow will pass through spillway at a depth of 0.47'.

** 25 year - 6 hour Peak Flow from Pond F = 7.46 cfs.
Flow will pass through spillway at a depth of 0.55'.

Calculations based on Broad Crested Weir Formula

$$Q = 3.087 bH^{1.5}; \text{ Where } b = \text{Average Width} = \frac{5 + (5 + 4d)}{2}$$

3.4 Sediment Pond Summary

- a) The Sediment ponds have been designed to contain the disturbed area (and contributing undisturbed area) runoff from a 10 year - 24 hour precipitation event, along with 3 years of sediment storage capacity. The Permanent Impoundment and Depression Area are sized to contain the runoff from a 100 year - 6 hour precipitation event. Runoff to the ponds will be directed by various ditches and culverts as described in the plan.**
- b) There will be a total of 6 sediment ponds and 2 additional impoundments on this site. Existing Sediment Ponds A, B and D will be eliminated and replaced with new ponds G, H and I. Existing sediment ponds E and F will be enlarged without changes to the dams. Existing sediment pond C, as well as the Permanent Impoundment and Depression Area will not be changed; however, sediment pond C will now flow to the new pond I, and will no longer be a UPDES discharge point.**
- c) The ponds will meet a theoretical detention time of 24 hours. All sediment ponds and the Permanent Impoundment are fitted with a combination of principal and emergency overflows sized to carry the runoff from a 25 year - 6 hour precipitation event. Any discharge from the ponds E, F, G, H and I will be in accordance with the approved UPDES Permit.**
- d) The pond inlets are protected from erosion. The principal spillways, and emergency spillways will also be protected from erosion by the use of culverts, rip-rap and/or belting.**
- e) The Permanent Impoundment and Depression Area are to be left in place.**
- f) The ponds have/will be constructed according to the design criteria listed under "Construction Specifications for Sedimentation Ponds".**

DESIGN OF DRAINAGE CONTROL STRUCTURES FOR RECLAMATION HYDROLOGY

Reclamation Hydrology

- 4.1 General**
- 4.2 Reclaimed Area Drainage Control**
- 4.3 Restored Channels**
- 4.4 Sediment Ponds**

Table 27 Final Reclamation - Drainage Areas Contributing to Channels

Table 28 Final Reclamation - Drainage Structure Flow Summary

Table 29 Final Reclamation - Restored Channel Design Parameters

Table 30 Final Reclamation - Restored Channel Flow Calculations

Figure 4 Restored Channel, Typical Sections

Reclamation Hydrology

4.1 General

The purpose of this section is to describe the plan for control of the permit and adjacent area hydrology during and after reclamation until bond release.

The plans herein described are based on requirements of the regulations and on proven, accepted reclamation techniques used in the Carbon-Emery area. The post-reclamation hydrology is designed to protect the reclaimed site from erosion, to protect the hydrologic regime from adverse impacts, and to meet requirement of DOGM and the landowner, BLM.

Upon completion of operations, all structures will be removed and the area will be recontoured as shown on Plate 8. All culverts and unnecessary ditches and ponds will be removed at that time. The post-reclamation drainage will be as shown on Plate 8.

Undisturbed UD-2 will remain in place, since it was installed prior to the operation, and has been shown to be adequate to carry a 100 year, 6 hour precipitation event.

As described in the following section, all sediment ponds will be removed during final reclamation, and recontoured as shown on Plate 8.

As sediment ponds are removed, any contaminated material will be hauled off to an approved disposal site. The 2-celled Permanent Impoundment will be left in place for wildlife enhancement, and the Depression Area will also remain as a final containment for runoff which was never planned to drain under the pre-existing Utah Railway.

Reclaimed channels are noted with an RC-Numer (i.e. RC-2). Channels are shown on Plate 8, "Reclamation Hydrology".

A typical channel cross-section for each reclaimed channel is shown on Figure 4. Calculated flows for the applicable storm event were then routed through the channels to determine if reclaimed channel sizes were adequate for the design flows. (See Table 30). In all cases, the channels were adequately sized to safely carry the contributing area runoff.

4.2 Reclaimed Area Drainage Control

During final reclamation, all previously installed drainage controls, including the sediment ponds, will be removed. The reclaimed area will be roughened by discontinuous tilling and/or "gouging" the area with a trackhoe bucket. The roughening will create furrows or depressions at approximately 18" deep throughout the reclaimed area. In addition, straw or wood mulch will be used in final seeding of the area. Roughening will continue to the reclaimed channel banks, and the entire reclaimed area, including channels, will be reseeded according to the approved plan.

Prior to removal of the sediment ponds, a series of 3 silt fences will be installed across the main drainage channel below the pond area, as shown on Plate 8. These silt fences will remain as final treatment for runoff from the reclaimed site until Phase II Bond Release requirements are met. These are, however, only secondary sediment controls. The primary sediment control from the reclaimed site will be extensive roughening/gouging, use of mulch and revegetation.

4.3 Restored Channels

The restored channels will have a bottom width of approximately 12' with 2h : 1v side slopes, and the side channels are proposed to have a bottom width of approximately 2' - 4' with 2h : 1v side slopes.

The restored channel sizes were checked adequacy to carry runoff from a 100 year - 6 hour storm event. As shown on Table 30, all channels are adequately sized to carry the projected runoff with at least 0.5' of freeboard. See Figure 4 for a typical section of the reclaimed channels and summary of flow depths and velocities.

4.4 Sediment Ponds

As discussed in Section 4.1, the sediment ponds will be removed during final reclamation. Prior to removal of the pond, a series of 3 silt fences will be placed across the main canyon channel below the pond. Sediment control for the reclamation will be accomplished by extensive roughening/gouging and revegetation of the reclaimed area and installation of sediment traps in the restored channels. The silt fences will act as secondary, final sediment controls. These fences will be maintained until Phase II Bond Release. See Plate 8 "Reclamation Hydrology" for location and reclamation details.

TABLE 27
FINAL RECLAMATION
DRAINAGE AREAS CONTRIBUTING TO CHANNELS

RECLAIMED CHANNEL	DRAINAGE AREAS
RD-1	DA-30, DA-31, DA-32, DA-38, DA-39, DA-40
RD-2	DA-19, DA-20, DA-21, DA-22, DA-23, DA-24, DA-25, ½DA-16, ½DA-17
RD-3	1/4 DA-16, DA-26, DA-27, DA-28
RD-4	DA-11, ½DA-12, DA-14, DA-9, DA-10, ½DA-17, 1/4 DA-16, DA-18
RD-5	1/3 DA-35, DA-36, DA-1, DA-2, DA-3, DA-4, DA-5, DA-6, DA-7, DA-8, ½ DA-12, DA-13, DA-15

Refer to Plate 2 for drainage areas and Plate 8 for reclamation channels.

TABLE 28
FINAL RECLAMATION
DRAINAGE STRUCTURE FLOW SUMMARY

Channel	100/6 cfs
RC-1	12.24
RC-2	22.50
RC-3	3.01
RC-4	20.29
RC-5	13.32

Flows from Table 2.

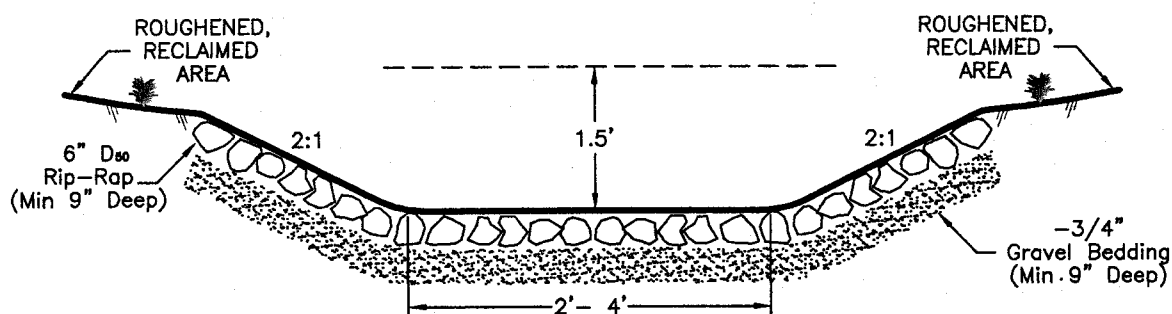
TABLE 29
FINAL RECLAMATION
RESTORED CHANNEL DESIGN PARAMETERS

Channel	Bottom Width (ft.)	Side Slope H:V	Slope %	Reclaimed Depth (ft.)	Manning's No.
RC-1	4	2:1	3.33	1.5	0.035
RC-2	4	2:1	4.17	1.5	0.035
RC-3	2	2:1	6.15	1.5	0.035
RC-4	4	2:1	4.14	1.5	0.035
RC-5	4	2:1	4.67	1.5	0.035

TABLE 30
FINAL RECLAMATION
RESTORED CHANNEL FLOW CALCULATIONS

Channel	RC-1	RC-2	RC-3	RC-4	RC-5
100 yr - 6 hr event (in.)	1.91	1.91	1.91	1.91	1.91
Peak Flow (cfs)	12.24	22.50	3.01	20.29	13.32
Velocity (fps)	4.41	5.77	3.96	5.58	5.10
Req'd Area (ft. ²)	2.77	3.90	0.76	3.64	2.61
Flow Depth (ft.)	0.55	0.72	0.29	0.68	0.52

RESTORED CHANNEL TYPICAL SECTIONS



SUMMARY TABLE			
CHANNEL	*FLOW DEPTH (FT.)	FREEBOARD (FT.)	VELOCITY (FPS)
RC-1	0.55	0.95	4.41
RC-2	0.72	0.78	5.77
RC-3	0.29	1.21	3.96
RC-4	0.68	0.82	5.58
RC-5	0.52	0.98	5.10

* BASED ON 100 YEAR - 6 HOUR STORM RUNOFF.

FIGURE 4

APPENDIX 1

COMPUTER BACKUP

Project Title = DA-1 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.6 acres

Hydraulic length = 250.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.6 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.59 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-1 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.6 acres

Hydraulic length = 250.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.6 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.27 cfs

Discharge volume = 0.13 acre ft

Project Title = DA-1 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.6 acres

Hydraulic length = 250.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.6 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.82 cfs

Discharge volume = 0.09 acre ft

Project Title = DA-1 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.6 acres

Hydraulic length = 250.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.6 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.24 cfs

Discharge volume = 0.13 acre ft

Project Title = DA-2 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.0 acres

Hydraulic length = 100.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.0 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.30 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-2 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.0 acres

Hydraulic length = 100.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.65 cfs

Discharge volume = 0.08 acre ft

Project Title = DA-2 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.0 acres

Hydraulic length = 100.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.0 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.42 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-2 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.0 acres

Hydraulic length = 100.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.63 cfs

Discharge volume = 0.09 acre ft

Project Title = DA-3 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 130.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.25 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-3 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 130.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.55 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-3 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 130.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.35 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-3 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 130.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.53 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-4 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 230.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.51 cfs

Discharge volume = 0.05 acre ft

Project Title = DA-4 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 230.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.11 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-4 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 230.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.71 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-4 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 230.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.08 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-5 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 420.00 feet

Elevation change = 17.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.57 cfs

Discharge volume = 0.05 acre ft

Project Title = DA-5 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 420.00 feet

Elevation change = 17.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.24 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-5 (25/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0
Area = 1.3 acres
Hydraulic length = 420.00 feet
Elevation change = 17.0 feet.
Concentration time = 0.06 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.5 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.80 cfs
Discharge volume = 0.07 acre ft

Project Title = DA-5 (100/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0
Area = 1.3 acres
Hydraulic length = 420.00 feet
Elevation change = 17.0 feet.
Concentration time = 0.06 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.9 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 1.21 cfs
Discharge volume = 0.11 acre ft

Project Title = DA-6 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.1 acres

Hydraulic length = 550.00 feet

Elevation change = 34.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.1 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.35 cfs

Discharge volume = 0.12 acre ft

Project Title = DA-6 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.1 acres

Hydraulic length = 550.00 feet

Elevation change = 34.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.1 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 2.95 cfs

Discharge volume = 0.25 acre ft

Project Title = DA-6 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.1 acres

Hydraulic length = 550.00 feet

Elevation change = 34.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.1 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.89 cfs

Discharge volume = 0.17 acre ft

Project Title = DA-6 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.1 acres

Hydraulic length = 550.00 feet

Elevation change = 34.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.1 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.86 cfs

Discharge volume = 0.26 acre ft

Project Title = DA-7 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 400.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.56 cfs

Discharge volume = 0.05 acre ft

Project Title = DA-7 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 400.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.22 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-7 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 400.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.78 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-7 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.3 acres

Hydraulic length = 400.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.19 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-8 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.8 acres

Hydraulic length = 700.00 feet

Elevation change = 33.0 feet.

Concentration time = 0.09 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.67 cfs

Discharge volume = 0.15 acre ft

Project Title = DA-8 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.8 acres

Hydraulic length = 700.00 feet

Elevation change = 33.0 feet.

Concentration time = 0.09 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 3.68 cfs

Discharge volume = 0.31 acre ft

Project Title = DA-8 (25/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 3.8 acres
Hydraulic length = 700.00 feet
Elevation change = 33.0 feet.
Concentration time = 0.09 hours
Unit hydrograph type = Disturbed

-- Total Area = 3.8 acres

-- Storm data
Total precipitation = 1.5 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 2.34 cfs
Discharge volume = 0.21 acre ft

Project Title = DA-8 (100/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 3.8 acres
Hydraulic length = 700.00 feet
Elevation change = 33.0 feet.
Concentration time = 0.09 hours
Unit hydrograph type = Disturbed

-- Total Area = 3.8 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 3.56 cfs
Discharge volume = 0.32 acre ft

Project Title = DA-9 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.6 acres

Hydraulic length = 700.00 feet

Elevation change = 33.0 feet.

Concentration time = 0.09 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.6 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.57 cfs

Discharge volume = 0.14 acre ft

Project Title = DA-9 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.6 acres

Hydraulic length = 700.00 feet

Elevation change = 33.0 feet.

Concentration time = 0.09 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.6 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 3.46 cfs

Discharge volume = 0.29 acre ft

Project Title = DA-9 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.6 acres

Hydraulic length = 700.00 feet

Elevation change = 33.0 feet.

Concentration time = 0.09 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.6 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.20 cfs

Discharge volume = 0.20 acre ft

Project Title = DA-9 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.6 acres

Hydraulic length = 700.00 feet

Elevation change = 33.0 feet.

Concentration time = 0.09 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.6 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.35 cfs

Discharge volume = 0.30 acre ft

Project Title = DA-10 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.4 acres

Hydraulic length = 400.00 feet

Elevation change = 17.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.4 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.35 cfs

Discharge volume = 0.22 acre ft

Project Title = DA-10 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.4 acres

Hydraulic length = 400.00 feet

Elevation change = 17.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 5.12 cfs

Discharge volume = 0.44 acre ft

Project Title = DA-10 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.4 acres

Hydraulic length = 400.00 feet

Elevation change = 17.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.4 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.28 cfs

Discharge volume = 0.30 acre ft

Project Title = DA-10 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.4 acres

Hydraulic length = 400.00 feet

Elevation change = 17.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 4.97 cfs

Discharge volume = 0.46 acre ft

Project Title = DA-11 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 4.5 acres

Hydraulic length = 600.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 4.5 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.94 cfs

Discharge volume = 0.18 acre ft

Project Title = DA-11 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 4.5 acres

Hydraulic length = 600.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 4.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 4.31 cfs

Discharge volume = 0.36 acre ft

Project Title = DA-11 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 4.5 acres

Hydraulic length = 600.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 4.5 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.73 cfs

Discharge volume = 0.25 acre ft

Project Title = DA-11 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 4.5 acres

Hydraulic length = 600.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 4.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 4.17 cfs

Discharge volume = 0.38 acre ft

Project Title = DA-12 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.4 acres

Hydraulic length = 480.00 feet

Elevation change = 2.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.4 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.15 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-12 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.4 acres

Hydraulic length = 480.00 feet

Elevation change = 2.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.36 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-12 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.4 acres

Hydraulic length = 480.00 feet

Elevation change = 2.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.4 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.22 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-12 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.4 acres

Hydraulic length = 480.00 feet

Elevation change = 2.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.34 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-13 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.6 acres

Hydraulic length = 300.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.6 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.26 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-13 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.6 acres

Hydraulic length = 300.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.6 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.57 cfs

Discharge volume = 0.05 acre ft

Project Title = DA-13 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.6 acres

Hydraulic length = 300.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.6 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.36 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-13 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.6 acres

Hydraulic length = 300.00 feet

Elevation change = 14.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.6 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.55 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-14 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 600.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.20 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.27 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-14 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 600.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.20 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.65 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-14 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 600.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.20 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.39 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-14 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 600.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.20 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.62 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-15 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 280.00 feet

Elevation change = 8.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.14 cfs

Discharge volume = 0.01 acre ft

Project Title = DA-15 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 280.00 feet

Elevation change = 8.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.31 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-15 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 280.00 feet

Elevation change = 8.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.20 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-15 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 280.00 feet

Elevation change = 8.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.30 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-16 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.0 acres

Hydraulic length = 640.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.32 cfs

Discharge volume = 0.12 acre ft

Project Title = DA-16 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.0 acres

Hydraulic length = 640.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 2.92 cfs

Discharge volume = 0.25 acre ft

Project Title = DA-16 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.0 acres

Hydraulic length = 640.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.85 cfs

Discharge volume = 0.17 acre ft

Project Title = DA-16 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.0 acres

Hydraulic length = 640.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.83 cfs

Discharge volume = 0.26 acre ft

Project Title = DA-17 (10/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 3.7 acres
Hydraulic length = 680.00 feet
Elevation change = 22.0 feet.
Concentration time = 0.11 hours
Unit hydrograph type = Disturbed

-- Total Area = 3.7 acres

-- Storm data
Total precipitation = 1.2 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 1.55 cfs
Discharge volume = 0.15 acre ft

Project Title = DA-17 (10/24)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 3.7 acres
Hydraulic length = 680.00 feet
Elevation change = 22.0 feet.
Concentration time = 0.11 hours
Unit hydrograph type = Disturbed

-- Total Area = 3.7 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS Type 2 storm, 24 hour storm
Peak Discharge = 3.45 cfs
Discharge volume = 0.30 acre ft

Project Title = DA-17 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.7 acres

Hydraulic length = 680.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.11 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.7 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.18 cfs

Discharge volume = 0.20 acre ft

Project Title = DA-17 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 3.7 acres

Hydraulic length = 680.00 feet

Elevation change = 22.0 feet.

Concentration time = 0.11 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.33 cfs

Discharge volume = 0.31 acre ft

Project Title = DA-18 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.0 acres

Hydraulic length = 480.00 feet

Elevation change = 26.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.0 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.19 cfs

Discharge volume = 0.20 acre ft

Project Title = DA-18 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.0 acres

Hydraulic length = 480.00 feet

Elevation change = 26.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 4.77 cfs

Discharge volume = 0.41 acre ft

Project Title = DA-18 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.0 acres

Hydraulic length = 480.00 feet

Elevation change = 26.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.0 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.06 cfs

Discharge volume = 0.28 acre ft

Project Title = DA-18 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.0 acres

Hydraulic length = 480.00 feet

Elevation change = 26.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 4.63 cfs

Discharge volume = 0.43 acre ft

Project Title = DA-19 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.7 acres

Hydraulic length = 370.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.7 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.75 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-19 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.7 acres

Hydraulic length = 370.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.64 cfs

Discharge volume = 0.14 acre ft

Project Title = DA-19 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.7 acres

Hydraulic length = 370.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.7 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.05 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-19 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.7 acres

Hydraulic length = 370.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.60 cfs

Discharge volume = 0.15 acre ft

Project Title = DA-20 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 250.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.5 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.88 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-20 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 250.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.91 cfs

Discharge volume = 0.20 acre ft

Project Title = DA-20 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

– Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 250.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

– Total Area = 2.5 acres

– Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.23 cfs

Discharge volume = 0.14 acre ft

Project Title = DA-20 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

– Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 250.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

– Total Area = 2.5 acres

– Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.85 cfs

Discharge volume = 0.21 acre ft

Project Title = DA-21 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 500.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.5 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.92 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-21 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 500.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 2.12 cfs

Discharge volume = 0.20 acre ft

Project Title = DA-21 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 500.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.5 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.31 cfs

Discharge volume = 0.14 acre ft

Project Title = DA-21 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.5 acres

Hydraulic length = 500.00 feet

Elevation change = 4.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.03 cfs

Discharge volume = 0.21 acre ft

Project Title = DA-22 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.7 acres

Hydraulic length = 730.00 feet

Elevation change = 29.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.7 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.41 cfs

Discharge volume = 0.23 acre ft

Project Title = DA-22 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.7 acres

Hydraulic length = 730.00 feet

Elevation change = 29.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 5.35 cfs

Discharge volume = 0.46 acre ft

Project Title = DA-22 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.7 acres

Hydraulic length = 730.00 feet

Elevation change = 29.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.7 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.39 cfs

Discharge volume = 0.31 acre ft

Project Title = DA-22 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 5.7 acres

Hydraulic length = 730.00 feet

Elevation change = 29.0 feet.

Concentration time = 0.10 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 5.17 cfs

Discharge volume = 0.48 acre ft

Project Title = DA-23 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 360.00 feet

Elevation change = 21.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.74 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-23 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 360.00 feet

Elevation change = 21.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.61 cfs

Discharge volume = 0.15 acre ft

Project Title = DA-23 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 360.00 feet

Elevation change = 21.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.03 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-23 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 360.00 feet

Elevation change = 21.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.56 cfs

Discharge volume = 0.15 acre ft

Project Title = DA-24 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

– Watershed data for watershed # 1

Curve number = 90.0

Area = 7.5 acres

Hydraulic length = 1150.00 feet

Elevation change = 48.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

– Total Area = 7.5 acres

– Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.79 cfs

Discharge volume = 0.30 acre ft

Project Title = DA-24 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

– Watershed data for watershed # 1

Curve number = 90.0

Area = 7.5 acres

Hydraulic length = 1150.00 feet

Elevation change = 48.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

– Total Area = 7.5 acres

– Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 6.43 cfs

Discharge volume = 0.60 acre ft

Project Title = DA-24 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 7.5 acres

Hydraulic length = 1150.00 feet

Elevation change = 48.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 7.5 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.98 cfs

Discharge volume = 0.42 acre ft

Project Title = DA-24 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 7.5 acres

Hydraulic length = 1150.00 feet

Elevation change = 48.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 7.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 6.17 cfs

Discharge volume = 0.63 acre ft

Project Title = DA-25 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 190.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.49 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-25 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 190.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.06 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-25 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 190.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.68 cfs

Discharge volume = 0.08 acre ft

Project Title = DA-25 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 190.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.03 cfs

Discharge volume = 0.12 acre ft

Project Title = DA-26 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.7 acres

Hydraulic length = 200.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.7 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.27 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-26 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.7 acres

Hydraulic length = 200.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.58 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-26 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.7 acres

Hydraulic length = 200.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.7 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.38 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-26 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.7 acres

Hydraulic length = 200.00 feet

Elevation change = 6.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.7 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.57 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-27 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.1 acres

Hydraulic length = 440.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.08 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.1 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.51 cfs

Discharge volume = 0.05 acre ft

Project Title = DA-27 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.1 acres

Hydraulic length = 440.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.08 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.1 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.12 cfs

Discharge volume = 0.09 acre ft

Project Title = DA-27 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.1 acres

Hydraulic length = 440.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.08 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.1 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.72 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-27 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.1 acres

Hydraulic length = 440.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.08 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.1 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.09 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-28 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 70.0

Area = 5.8 acres

Hydraulic length = 525.00 feet

Elevation change = 30.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.09 cfs

Discharge volume = 0.01 acre ft

Project Title = DA-28 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 70.0

Area = 5.8 acres

Hydraulic length = 525.00 feet

Elevation change = 30.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.89 cfs

Discharge volume = 0.09 acre ft

Project Title = DA-28 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 70.0

Area = 5.8 acres

Hydraulic length = 525.00 feet

Elevation change = 30.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.16 cfs

Discharge volume = 0.04 acre ft

Project Title = DA-28 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 70.0

Area = 5.8 acres

Hydraulic length = 525.00 feet

Elevation change = 30.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 5.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.64 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-29 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.5 acres

Hydraulic length = 350.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.5 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.61 cfs

Discharge volume = 0.06 acre ft

Project Title = DA-29 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.5 acres

Hydraulic length = 350.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.32 cfs

Discharge volume = 0.12 acre ft

Project Title = DA-29 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.5 acres

Hydraulic length = 350.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.5 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.85 cfs

Discharge volume = 0.08 acre ft

Project Title = DA-29 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.5 acres

Hydraulic length = 350.00 feet

Elevation change = 18.0 feet.

Concentration time = 0.04 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.28 cfs

Discharge volume = 0.12 acre ft

Project Title = DA-30 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 400.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.57 cfs

Discharge volume = 0.05 acre ft

Project Title = DA-30 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 400.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.25 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-30 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 400.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.80 cfs

Discharge volume = 0.08 acre ft

Project Title = DA-30 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.4 acres

Hydraulic length = 400.00 feet

Elevation change = 20.0 feet.

Concentration time = 0.05 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.21 cfs

Discharge volume = 0.11 acre ft

Project Title = DA-31 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.64 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-31 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.52 cfs

Discharge volume = 0.14 acre ft

Project Title = DA-31 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.93 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-31 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.45 cfs

Discharge volume = 0.15 acre ft

Project Title = DA-32 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.2 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.80 cfs

Discharge volume = 0.09 acre ft

Project Title = DA-32 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.2 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.90 cfs

Discharge volume = 0.18 acre ft

Project Title = DA-32 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.2 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.16 cfs

Discharge volume = 0.12 acre ft

Project Title = DA-32 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 2.2 acres

Hydraulic length = 1100.00 feet

Elevation change = 24.0 feet.

Concentration time = 0.21 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.81 cfs

Discharge volume = 0.19 acre ft

Project Title = DA-33 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 6.4 acres

Hydraulic length = 600.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.13 hours

Unit hydrograph type = Disturbed

-- Total Area = 6.4 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.56 cfs

Discharge volume = 0.26 acre ft

Project Title = DA-33 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 6.4 acres

Hydraulic length = 600.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.13 hours

Unit hydrograph type = Disturbed

-- Total Area = 6.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 5.81 cfs

Discharge volume = 0.52 acre ft

Project Title = DA-33 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 6.4 acres

Hydraulic length = 600.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.13 hours

Unit hydrograph type = Disturbed

-- Total Area = 6.4 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 3.64 cfs

Discharge volume = 0.36 acre ft

Project Title = DA-33 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 6.4 acres

Hydraulic length = 600.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.13 hours

Unit hydrograph type = Disturbed

-- Total Area = 6.4 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 5.59 cfs

Discharge volume = 0.55 acre ft

Project Title = DA-34 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 81.5 acres

Hydraulic length = 2900.00 feet

Elevation change = 260.0 feet.

Concentration time = 0.27 hours

Unit hydrograph type = Disturbed

-- Total Area = 81.5 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.37 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-34 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 81.5 acres

Hydraulic length = 2900.00 feet

Elevation change = 260.0 feet.

Concentration time = 0.27 hours

Unit hydrograph type = Disturbed

-- Total Area = 81.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 1.73 cfs

Discharge volume = 0.66 acre ft

Project Title = DA-34 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 81.5 acres

Hydraulic length = 2900.00 feet

Elevation change = 260.0 feet.

Concentration time = 0.27 hours

Unit hydrograph type = Disturbed

-- Total Area = 81.5 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 1.21 cfs

Discharge volume = 0.19 acre ft

Project Title = DA-34 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 81.5 acres

Hydraulic length = 2900.00 feet

Elevation change = 260.0 feet.

Concentration time = 0.27 hours

Unit hydrograph type = Disturbed

-- Total Area = 81.5 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.99 cfs

Discharge volume = 0.76 acre ft

Project Title = DA-35 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 3.0 acres

Hydraulic length = 200.00 feet

Elevation change = 86.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.01 cfs

Discharge volume = 0.00 acre ft

Project Title = DA-35 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 3.0 acres

Hydraulic length = 200.00 feet

Elevation change = 86.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.06 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-35 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 3.0 acres

Hydraulic length = 200.00 feet

Elevation change = 86.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.03 cfs

Discharge volume = 0.01 acre ft

Project Title = DA-35 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 3.0 acres

Hydraulic length = 200.00 feet

Elevation change = 86.0 feet.

Concentration time = 0.01 hours

Unit hydrograph type = Disturbed

-- Total Area = 3.0 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.07 cfs

Discharge volume = 0.03 acre ft

Project Title = DA-36 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 2.2 acres

Hydraulic length = 820.00 feet

Elevation change = 106.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.01 cfs

Discharge volume = 0.00 acre ft

Project Title = DA-36 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 2.2 acres

Hydraulic length = 820.00 feet

Elevation change = 106.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.07 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-36 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 2.2 acres

Hydraulic length = 820.00 feet

Elevation change = 106.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.03 cfs

Discharge volume = 0.01 acre ft

Project Title = DA-36 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 2.2 acres

Hydraulic length = 820.00 feet

Elevation change = 106.0 feet.

Concentration time = 0.06 hours

Unit hydrograph type = Disturbed

-- Total Area = 2.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.09 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-37 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 202.8 acres

Hydraulic length = 5600.00 feet

Elevation change = 290.0 feet.

Concentration time = 0.68 hours

Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.71 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-37 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 202.8 acres

Hydraulic length = 5600.00 feet

Elevation change = 290.0 feet.

Concentration time = 0.68 hours

Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 3.42 cfs

Discharge volume = 1.64 acre ft

Project Title = DA-37 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 202.8 acres

Hydraulic length = 5600.00 feet

Elevation change = 290.0 feet.

Concentration time = 0.68 hours

Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.66 cfs

Discharge volume = 0.47 acre ft

Project Title = DA-37 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 202.8 acres

Hydraulic length = 5600.00 feet

Elevation change = 290.0 feet.

Concentration time = 0.68 hours

Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 6.89 cfs

Discharge volume = 1.89 acre ft

Project Title = DA-38 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 9.1 acres

Hydraulic length = 1800.00 feet

Elevation change = 170.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 9.1 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.04 cfs

Discharge volume = 0.00 acre ft

Project Title = DA-38 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 9.1 acres

Hydraulic length = 1800.00 feet

Elevation change = 170.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 9.1 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.19 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-38 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 9.1 acres

Hydraulic length = 1800.00 feet

Elevation change = 170.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 9.1 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.13 cfs

Discharge volume = 0.02 acre ft

Project Title = DA-38 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 9.1 acres

Hydraulic length = 1800.00 feet

Elevation change = 170.0 feet.

Concentration time = 0.16 hours

Unit hydrograph type = Disturbed

-- Total Area = 9.1 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.32 cfs

Discharge volume = 0.08 acre ft

Project Title = DA-39 (10/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 65.0
Area = 202.8 acres
Hydraulic length = 5600.00 feet
Elevation change = 290.0 feet.
Concentration time = 0.68 hours
Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data
Total precipitation = 1.2 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.71 cfs
Discharge volume = 0.07 acre ft

Project Title = DA-39 (10/24)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 65.0
Area = 202.8 acres
Hydraulic length = 5600.00 feet
Elevation change = 290.0 feet.
Concentration time = 0.68 hours
Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS Type 2 storm, 24 hour storm
Peak Discharge = 3.42 cfs
Discharge volume = 1.64 acre ft

Project Title = DA-39 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 202.8 acres

Hydraulic length = 5600.00 feet

Elevation change = 290.0 feet.

Concentration time = 0.68 hours

Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 2.66 cfs

Discharge volume = 0.47 acre ft

Project Title = DA-39 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 65.0

Area = 202.8 acres

Hydraulic length = 5600.00 feet

Elevation change = 290.0 feet.

Concentration time = 0.68 hours

Unit hydrograph type = Disturbed

-- Total Area = 202.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 6.89 cfs

Discharge volume = 1.89 acre ft

Project Title = DA-40 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 35.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.32 cfs

Discharge volume = 0.07 acre ft

Project Title = DA-40 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 35.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.69 cfs

Discharge volume = 0.14 acre ft

Project Title = DA-40 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 35.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.45 cfs

Discharge volume = 0.10 acre ft

Project Title = DA-40 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.8 acres

Hydraulic length = 35.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.67 cfs

Discharge volume = 0.15 acre ft

Project Title = A-1 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 150.00 feet

Elevation change = 8.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.27 cfs

Discharge volume = 0.03 acre ft

Project Title = A-1 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.8 acres

Hydraulic length = 150.00 feet

Elevation change = 8.0 feet.

Concentration time = 0.02 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.59 cfs

Discharge volume = 0.07 acre ft

Project Title = A-1 (25/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 0.8 acres
Hydraulic length = 150.00 feet
Elevation change = 8.0 feet.
Concentration time = 0.02 hours
Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data
Total precipitation = 1.5 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.38 cfs
Discharge volume = 0.05 acre ft

Project Title = A-1 (100/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 0.8 acres
Hydraulic length = 150.00 feet
Elevation change = 8.0 feet.
Concentration time = 0.02 hours
Unit hydrograph type = Disturbed

-- Total Area = 0.8 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.57 cfs
Discharge volume = 0.07 acre ft

Project Title = A-2 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 230.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.10 cfs

Discharge volume = 0.01 acre ft

Project Title = A-2 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 230.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.21 cfs

Discharge volume = 0.02 acre ft

Project Title = A-2 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 230.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.14 cfs

Discharge volume = 0.01 acre ft

Project Title = A-2 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.3 acres

Hydraulic length = 230.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.03 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.3 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.21 cfs

Discharge volume = 0.02 acre ft

Project Title = A-8 (10/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 1.2 acres
Hydraulic length = 30.00 feet
Elevation change = 10.0 feet.
Concentration time = 0.00 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data
Total precipitation = 1.2 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.21 cfs
Discharge volume = 0.05 acre ft

Project Title = A-8 (10/24)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 1.2 acres
Hydraulic length = 30.00 feet
Elevation change = 10.0 feet.
Concentration time = 0.00 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS Type 2 storm, 24 hour storm
Peak Discharge = 0.44 cfs
Discharge volume = 0.09 acre ft

Project Title = A-8 (25/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 1.2 acres
Hydraulic length = 30.00 feet
Elevation change = 10.0 feet.
Concentration time = 0.00 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data
Total precipitation = 1.5 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.29 cfs
Discharge volume = 0.06 acre ft

Project Title = A-8 (100/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 1.2 acres
Hydraulic length = 30.00 feet
Elevation change = 10.0 feet.
Concentration time = 0.00 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.43 cfs
Discharge volume = 0.10 acre ft

Project Title = A-9 (10/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.2 acres

Hydraulic length = 30.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.2 acres

-- Storm data

Total precipitation = 1.2 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.03 cfs

Discharge volume = 0.01 acre ft

Project Title = A-9 (10/24)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.2 acres

Hydraulic length = 30.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS Type 2 storm, 24 hour storm

Peak Discharge = 0.07 cfs

Discharge volume = 0.01 acre ft

Project Title = A-9 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.2 acres

Hydraulic length = 30.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.2 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.04 cfs

Discharge volume = 0.01 acre ft

Project Title = A-9 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 0.2 acres

Hydraulic length = 30.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 0.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.07 cfs

Discharge volume = 0.02 acre ft

Project Title = A-10 (10/6)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 1.2 acres
Hydraulic length = 30.00 feet
Elevation change = 10.0 feet.
Concentration time = 0.00 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data
Total precipitation = 1.2 inches
Storm type = SCS 6 hour design storm
Peak Discharge = 0.21 cfs
Discharge volume = 0.05 acre ft

Project Title = A-10 (10/24)
WATERSHED HYDROGRAPH
Inflow into structure # 1
Structure type: Null

-- Watershed data for watershed # 1
Curve number = 90.0
Area = 1.2 acres
Hydraulic length = 30.00 feet
Elevation change = 10.0 feet.
Concentration time = 0.00 hours
Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data
Total precipitation = 1.9 inches
Storm type = SCS Type 2 storm, 24 hour storm
Peak Discharge = 0.45 cfs
Discharge volume = 0.10 acre ft

Project Title = A-10 (25/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.2 acres

Hydraulic length = 30.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data

Total precipitation = 1.5 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.29 cfs

Discharge volume = 0.07 acre ft

Project Title = A-10 (100/6)

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

-- Watershed data for watershed # 1

Curve number = 90.0

Area = 1.2 acres

Hydraulic length = 30.00 feet

Elevation change = 10.0 feet.

Concentration time = 0.00 hours

Unit hydrograph type = Disturbed

-- Total Area = 1.2 acres

-- Storm data

Total precipitation = 1.9 inches

Storm type = SCS 6 hour design storm

Peak Discharge = 0.44 cfs

Discharge volume = 0.10 acre ft

APPENDIX S

2007 MODIFICATION PLAN

WILDCAT LOADOUT
2007 MODIFICATION PLAN
MAY 17, 2007

The Wildcat Mining and Reclamation Plan was last approved and incorporated in May, 2006. Since that time there have been three developments that involve changes in the permit, namely:

1) A conceptual plan has been agreed upon (by the Division and Andalex Resources) to address Division Order DO-04. This Order, formally known as "Design Drawings and Specifications", generally relates to the problem of wind-blown fines that have left the permit area. This plan, which addresses the requirements of the Order, are included in this amendment.

2) Due to increased production from the mines the primary coal storage area around the radial stacker needs to be expanded. This amendment includes the expansion of the coal storage pad by approximately 3.5 acres.

3) Due to the increased operational requirements, an equipment and material storage area is to be added to the west side of the facility. This storage area will be about six acres in size.

These three changes are herein-after referred to collectively as the "2007 Modification Plan". All of these three changes involve additional disturbance, new topsoil removal and storage areas, additional sediment control structures, and increased reclamation and bonding commitments. The changes involving each individual element of the plan become linked with the other elements and the overall existing Mining and Reclamation Plan. Therefore, this plan amendment includes the addition of all three components which are described in detail below. Because the plan amendment involves issues of right of entry (Ch. 1), soils (Ch. 2), vegetation (Ch. 3), air quality (Ch. 4), engineering and reclamation (Ch. 5), sediment and drainage control (Ch. 7), and bonding (Ch. 8), the detailed description contained in this Appendix is by reference made to be an integral part of the text of each chapter.

The Wildcat MRP was recently re-formatted to the newer R645 regulations. Since this reformatted MRP was recently approved and incorporated, text changes for the specific regulations under this submittal are as minimal as possible and are made only where necessary to avoid inconsistencies. The detailed descriptive

narrative included in this introduction is intended to adequately address most of the regulations (in addition to the specific changes in the MRP sections themselves). Therefore, responses to specific issues in individual sections of each chapter will often be made by reference to this Appendix, "2007 Modification Plan". All discussion relevant to this Modification Plan is presented in the MRP in italics to differentiate it from the previously approved reformatted version.

1) DIVISION ORDER DO-04, WIND-BLOWN FINES:

On August 9, 2004, the Division issued Order DO-04 which requires Andalex to address the issue of wind-blown fines arising from the operation of the loadout facility, primarily from the stockpiles and stackers, and from truck traffic on the roads. Over the past 24 years of operation, coal fines have drifted onto the undisturbed topsoil downwind from the primary coal storage area, and in some areas have blown beyond the existing DOGM permit area. This has involved the eastern part of the property which is down-wind from facilities in the direction of the prevailing winds in this area.

On February 5, 2007 the BLM approved an amendment to Right-of-Way U-48027 which expanded the size of the grant from 100 acres to 270 acres (See Appendix B-12A and Plate 1). (It is important to note that this is a non-exclusive areal right-of-way, and that there are numerous other equally valid rights-of-way which occupy much of this same area. For example, overlapping rights-of-ways exist for the Utah Railway tracks, the State Highway 139, the Carbon County Consumers Road, the by-pass road, the Trestle public road, Rocky Mountain Power 46 KV powerline, Phillip Petroleum's gas well and pipeline corridor, and Hidden Splendor shop facility. BLM determined the final 270 acre configuration in part to "square up" the boundary for administrative purposes. Being a non-exclusive right-of-way means there is no conflict among grantees, and no inherent liability from one grantee to the next, as long as each grantee's activities are within the terms of their respective right-of-way.) Most of the increased area of the expanded right-of-way was on the east side of the property where the accumulated coal fines were at issue. Indeed, the primary reason for granting the expanded right-of-way was to allow additional area to construct drainage control structures to confine and contain the wind-blown coal fines. The Environmental Analysis prepared by the BLM addressed the issue specifically (See Appendix T). The overall concept approved by the BLM included the construction of diversion ditches around the perimeter of the accumulation zone,

leading to new sediment ponds located down-drainage from the existing ponds. In this manner no wind-blown coal fines would leave the property, and no coal fines would make their way into any of the undisturbed natural drainages.

In addition to preventing the fines from leaving the property it was also necessary to address the issue of the coal fines which had accumulated on the existing undisturbed topsoil located near the downwind side of the coal storage pile. To better quantify the areal extent and depth of the coal fines accumulation E.I.S. (Environmental Industrial Services) conducted an intensive survey of the area (see Appendix U). More than 300 locations were surveyed for fines accumulation, and a map was prepared which depicts the results. The study showed that the majority of the fine were deposited within 150' of the existing coal storage area, with highest concentrations occurring in topographic low depressions and drainages. The rate of accumulation generally decreases exponentially with distance from the coal-pile area. Therefore, in consultation with Division staff, it was determined that the most effective means of protecting the existing resource in this area was to strip the topsoil in this area and stockpile it farther away from the coal storage facilities. This is to be done in a 150' wide swath around the eastern edge of the existing (and proposed extended) coal storage area. This area is shown on Plate 1A and is called the "drop zone".

The drop zone is intended not only as a topsoil salvage area but as a area where coal fines in the future can drop without harm to other resources. It should be noted that this new drop zone will be 150' beyond any existing or new coal-pile area, but because the coal storage area will itself be expanded to the east, the coal fines problem should be further alleviated because the primary source of airborne coal fines is the drop-point from the existing radial stacker. The drop zone will not only be 150' from the edge of the (new) coal-pile area but will be nearly 250' additionally removed from the existing stacker drop-point measured in the down-wind direction.

The expansion of the coal storage area and the creation of the 150' wide drop zone will require that Sediment Ponds A and B be removed. Three additional sediment ponds (Ponds G, H and I) will be constructed down-drainage from the drop zone (See Plate 1A). Even with the extended drop zone (and the increased distance away from the stacker drop-points) there is a possibility that some coal fines may still be blown beyond the drop zone, especially in the event of extraordinarily strong

winds. Based on the existing surveys (which reflect nearly 25 years of previous operation experience at Wildcat) such future accumulations are expected to be slight. However, to insure that all wind-blown fines, however slight, are confined and contained within the property, a set of diversion ditches will be constructed (See Plates 1A and 2), and the new sed ponds will be located such that effectively all coal fines will be prevented from leaving the property and getting into the natural drainages downstream from the loadout facility.

The drop zone, the perimeter ditches and the new sediment ponds are meant to control and treat much of the coal fines which originate from the coal-pile area and specifically from the stacker drop-points. However, an additional source of coal fines and dust is from the truck traffic on the haul roads within the loadout facility. The primary source of dust is the loop road leading to and from the truck dumps (PR 2). This road is presently a gravel surface from the gate on around the loop. As many as 400 trucks per day travel around this loop. As a means of mitigating this dust situation Andalex commits to hard-surfacing this section as part of the overall "2007 Modification Plan". An additional source of dust is PR 5, which is the access road around the eastern edge of the existing coal-pile area. This road was never really intended to accommodate heavy truck traffic, but has recently been pressed into service because of the increased production from the mines, and contract commitments that require segregated storage for certain customers. Presently the road is built on native material, which contributes to the dusting situation. This road will be relocated as the coal storage area is expanded as part of the 2007 Modification Plan, and Andalex commits that the new road will be constructed with a substantial gravel base, and that the road will be treated with mag chloride and/or water as necessary in the future to control fugitive dust.

2) EXPANSION OF COAL PILE STORAGE AREA

To accommodate the increased coal production from the mines it is necessary to expand the primary coal storage area around the radial stacker. This will involve adding approximately 3.5 acres to the existing storage pad. (Andalex applied for a minor change to the air quality permit from the Utah Division of Air Quality for the increased storage area on March 6, 2007). The pad will be extended by sloping off the existing storage pad, by hauling in coal mine waste (from the existing refuse pile at Wildcat) for deposit, and by re-contouring and smoothing out the surface of the expanded storage area/drop zone (see Plate 1A).

Prior to topsoil salvaging operations, excessive coal fines on the surface (greater than 6" deep) will be removed by using a grader and track-hoe. This cleaned-up coal fines material will be either put back into the active coal storage area to be loaded out, or if the quality is too poor will be placed in the existing coal refuse pile on the west side of the facility. Prior to pad construction, topsoil will then be removed from the new storage area, and from the adjacent drop zone. Twenty four inches (24") of topsoil will be salvaged from this combined area. Topsoil will be salvaged with a dozer and/or a track hoe/dump truck combination. Topsoil will be salvaged from the area and placed in several linear piles to be located around the southeastern perimeter of the drop zone. Four piles will be constructed, as depicted on Plate 1A. These piles will be long and will generally not exceed 12'-15' high, and the width will vary according to the volume from the associated salvage area. Side slopes will not exceed 2H:1V. Plates 13A and 13B give an approximation of the proposed pile dimensions. Existing topsoil pile A will remain in its present location and will essentially be subsumed by the construction of new topsoil pile M.

The topsoil piles will be located down-wind beyond the drop zone and should be adequately protected from future wind-blown fines. However, there will always be a slight likelihood that some coal fines will eventually make their way to the piles. Therefore, to protect the piles against any potential from future coal fines contamination an additional 6" of extra material will be placed over the top of each pile. This additional 6" layer will constitute a protective cap layer for the pile. This cap layer will be made of material which is, in and of itself, suitable topsoil material. According to the most recent topsoil survey done in this area (see Appendix D, Supplement) native material down to a depth of several feet are acceptable topsoil. Therefore by using more of the existing material as the cap layer the topsoil pile itself will remain protected without fear of contamination from the cap layer. If, at the time of final reclamation, it is determined (with concurrence from the Division) that the cap layer is too contaminated with coal fines to use for topsoil, the cap layer will be removed and disposed of as coal mine waste according to the existing approved reclamation plan. Or the excess fines can simply be vacuumed off first, if this option is acceptable to the Division at the time. If however, the cap layer is not contaminated it will be used along with the rest of the pile as suitable topsoil for reclamation. This determination will be made at the time of final reclamation. The volume of cap layer will not be calculated into the volume of the topsoil pile in determining topsoil balance for reclamation

purposes. It should be noted that we do not expect much if any coal fines accumulation on the new topsoil piles, given the increased distance away from the stacker drop-points and the body of the main coal pile. But the measures described above are "just-in-case" contingencies, to provide a high degree of assurance that the stockpiled topsoil resource will be in optimum condition when called on at the time of final reclamation.

After the topsoil piles are constructed, they will be roughened to retain moisture and will be re-vegetated with an interim seed mix as per the approved reclamation plan (see section R645-301-212) All piles will have a berm constructed along the down-slope side to prevent loss of material. All pile will be adequately identified with signs to assure they are not inadvertently affected by the operations.

After the topsoil has been salvaged from the coal pad area and the drop zone area work can begin on constructing the coal pad extension. Some material from the existing coal storage pad will be graded into the new extension. This will result in a pad surface which is not quite as level as the one presently existing, but will be more gently sloping off to the east as it transitions into the new pad area. Since there will be no reclaim draw-down ports under this part of the coal storage pad the fact that it slopes off somewhat will not present any operational difficulty. Additionally, some of the coal refuse material which is presently stored in the approved site on the west side of the facility may be hauled in to help build up the new coal storage pad. Use of this material is approved for such use under the currently approved plan, as described in Section R645-301-512-230, and has been done in the past. Analysis of this material shows that it is not toxic nor acid-forming (see Appendix O, Supplement). Potential sites of refuse fill are depicted on Plate 1A. (After the coal pad construction is completed a detailed survey of the refuse fill areas will be completed, and a new "as-built" map will be prepared of the fill areas and the main refuse pile so that a complete and accurate account of the total refuse volumes will be made.) A third source of material for constructing the new coal pad is from the native material existing at the location. This area is somewhat undulated, and by grading off the higher areas and filling in the lower areas the coal pad area can be graded into a fairly uniform surface suitable for storing and reclaiming the extended coal pile.

As mentioned previously the drop zone will be a least 150 wide and will extend the full length of the expanded coal pile

storage area. The re-located access road (PR 5) will separate the drop zone from the extended coal pad. Topsoil will be removed from the drop zone prior to construction of the coal pad, and stored as described above. After the area is re-contoured, the entire drop zone will be gouged and roughened. The purpose of this roughening is two-fold. First, it will help hold moisture so that the area can be re-vegetated to help control erosion. Secondly, and more importantly, the roughened surface will help prevent the migration of coal fines away from the coal pile. It is expected that there will be wind-blown coal fine which drop into this area; indeed, this is the primary reason for constructing the drop zone in the first place. However, coal fines travel downwind and cross country by two methods; one is when the fines become airborne, usually from the drop point of the radial stacker, and the second is when coal fines already on the ground cascade or hop-scotch from point to point with succeeding wind storms. In this manner the fines migrate steadily downwind much as sand dunes move over time. Rainfall events also move the fines down-gradient (which at Wildcat is also down wind). By roughing and pocking the drop zone this method of ground-hopping migration from both wind and water is greatly reduced. The depressions serve as effective traps for the coal fines, and will be covered over upon final reclamation. After the drop zone has been roughened it will be re-seeded with an interim seed mix. However, this area will be an active part of the operation and this re-seeding is not to be considered part of any short term or interim reclamation as such. At the lower (eastern) edge of the drop zone a perimeter ditch will be constructed. Any coal fines which make it across the drop zone will be contained by this ditch and will be directed to one of the three sediment ponds located below the disturbed area. An limited-access road will be provided along this ditch to allow for maintenance of the ditch. Other than the perimeter ditch and access road there will be no vehicular traffic, coal storage, or material storage within the drop zone during the remaining life of the operation.

Before any construction begins in this area temporary sediment control devices will be installed. These will consist of straw bales and/or silt fences installed in the three primary drainages leading westward away from the site. After the temporary sediment control measures are in place construction will begin on the three new sediment ponds. These ponds will be located in the three aforementioned drainages and will be located immediately adjacent to and west of the public road which flanks the eastern edge of the facility. The ponds will be so positioned so as to avoid the buried gas-line corridor which is

located along the northwest side of this road. These ponds will be adequately sized to accommodate the runoff volume and sediment volume as determined by the Sedimentation and Drainage Control Plan (see Appendix R). However, Pond I will be over-constructed because excavated material from the pond (not including topsoil removal) will be used to backfill existing Pond D. It was determined (with concurrence from the Division) that Pond D should be eliminated since it is difficult to maintain given its present location next to the secondary coal storage area. All drainage control functions presently handled by Pond D will be handled by new Pond I and existing in the future. Material needed to backfill Pond D will be generated by over-excavation of Pond I (and/or from the existing refuse pile) . A construction road will be built between the two pond areas to facilitate this activity. After the pond construction/backfilling project is completed the road will be left in place to allow maintenance and cleaning of Pond I. Similarly, Pond G is oversized so that it too can serve as a borrow source for construction of the coal pad extension if needed. Pond H will be not be oversized since it is not contiguous with the pad construction area. Construction access to Pond H will be from the adjacent public road. Existing Pond E will also be enlarged slightly (by deepening) in order to handle some of the runoff previously reporting to Pond D. Material excavated from the deepening Pond E will be used to help backfill Pond D. Additional information regarding the design specifications of all ponds can be found in Appendix R, Plate 2 and Plates 3C through 3F.

Within the area of the pond impoundments, topsoil will be salvaged to a depth of 24". This topsoil material will be used to construct the dams themselves. In this manner each newly constructed sediment pond dam becomes an isolated topsoil pile. This proposal was made with concurrence from Division staff. It has the advantage of keeping the topsoil stored in several smaller individual piles rather than in one large deep pile. Because the inside slope of the dam is also the slope of the topsoil pile, and since the lower part of this slope may eventually be contaminated by impounded runoff material, this inner surface will be covered with a protective cap layer (similar to the perimeter piles below the drop zone). This cap layer (see Plates 3D, 3E and 3F) will be removed if necessary during final reclamation, and disposed of as coal mine waste according to the approved reclamation plan. Because the volume of topsoil salvaged at each of the pond sites is a function of the overall impoundment area (and the commitment to salvage 24") the dams for some of the ponds are larger than they would normally have to be. This reflects their dual nature as pond

impoundments and topsoil storage piles. After construction, the out-slopes and the in-slopes above the high-water level will be gouged and roughened and re-seeded with an approved interim seed mix according to the existing approved reclamation plan. After the ponds are constructed, the perimeter ditches (D-10 leading into Pond I, and D-25 leading into Pond G) will be constructed (see Plate 2). Topsoil along these linear ditch structures will be scraped off (6" deep) and laid on the downslope side of the ditch in the form of a long low berm using a single-pass from a grader. Later, upon final reclamation this topsoil berm can be spread back over the adjacent reclaimed ditch line. (During operations, cleanout material from these ditches will be relocated on the up-slope side of the maintenance way opposite the ditch so that no cleanout material is placed on or over the topsoil berm.) With the sediment ponds and perimeter ditches in place, the entire operational area and construction area will be protected from sediment runoff by the new ponds. Only after the new ponds and perimeter ditches are in place and functioning will construction of the coal pad and drop zone begin.

Prior to construction of the expanded coal storage pad Sediment Ponds A and B will be removed. New Pond G will have already been installed prior to removing Ponds A and B. Since Pond G collects drainage from the same areas as Ponds A and B there will be no loss of sediment control protection when Ponds A and B are eliminated. Once all of the new ponds (G, H and I) have been installed and certified Andalex will provide written notification to Utah Division of Water Quality designating the out fall of these ponds as new UPDES discharge points. These will actually be transferred discharge points from ponds A, B and D which will all be eliminated as part of the 2007 Modification Plan.

The existing vegetation reference area is located in the southeastern corner of the property. This area will be partially covered by the drop zone and will have to be relocated. Patrick Collins (Mt. Nebo Scientific) has studied the area surrounding the loadout and has determined a suitable site for a new vegetation reference area (see Appendix I, Supplement). This site is located south of the train loading structure, bounded on either side by the railroad tracks and the Trestle Road (see Plate 1A). Although this site has been determined to be representative, a full analysis of species density cannot be made until later in the summer growing season. Mr. Collins will prepare a detail survey of the new vegetation reference area in the summer of 2007 and this report will be added to Appendix I,

Supplement.

3) EQUIPMENT AND MATERIAL STORAGE AREA

A material storage area is proposed for the area west of the train loadout tower and will occupy about 6 acres. This area is essentially flat and is contiguous with the existing operational area of the loadout facility (see Plate 1A). The area is immediately adjacent to the existing coal refuse storage pile and topsoil piles B and E. There will be no permanent structures or facilities on the site. The storage area may be constructed in stages on an as needed basis. Prior to constructing the storage pad topsoil will be salvaged from the site. Four soil test pits have been dug around the area and the soils evaluation was conducted by Priscilla Burton of the Division (see Appendix I, Supplement). Based on this survey it was determined that suitable topsoil resources exist to a depth of several feet. A minimum of 24" of topsoil will be salvaged from the area and will be stockpiled in a linear pile flanking the north side of the storage area along the base of the slope of the adjacent existing east-west trending escarpment. The pile will be approximately 600' long, 100' wide and 12'-15' high (see Plate 13B). After the pile has been built and contoured it will be gouged and roughened to hold moisture and prevent erosion. The pile will then be re-seeded with an interim seed mix according to the approved reclamation plan. The out-slope of the pile will be bermed to prevent loss of material from erosion.

Prior to any surface disturbance a drainage ditch will be constructed around the perimeter of the site. This ditch will drain to existing Sediment Pond F. The existing undisturbed drainage ditch which presently runs through the area will be re-classified as a disturbed drainage ditch (U-38) and will be re-routed into Pond F. In order to accommodate the increased runoff and sediment volume from the new storage area and the undisturbed area, Pond F will have to be enlarged. (Refer to Appendix R and Plate 3C for details of the new pond sizing and drainage ditch configurations.) In order to allow access room for the new ditches to enter Pond F the southern end of existing topsoil pile B and E (combined) will have to be shaved off. This material will be pushed up to the top of the existing piles and will be used to partially fill the swale which is now present between the two piles. After the nose of the pile is re-configured for the ditches it will be roughened, re-seeded and bermed as before. A track-hoe and/or front-end loader will be used to re-shape the pile.

After the topsoil has been salvaged and stockpiled the area will be graded to create a smooth even site suitable for storing material and equipment. Since the area is already fairly uniform this should involve little more than making several passes with a grader. Access to the material storage area will be provided by re-aligning part of existing road PR-11 as shown on Plate 2. This extended road segment will be graveled upon completion.

4) TOPSOIL DEFICIT REMOVAL

Presently there are four topsoil piles existing at Wildcat. However, because Wildcat was not originally permitted under SMCRA regulations the existing topsoil volume is not sufficient to reclaim the existing disturbed area to a depth of 6" as required under the approved reclamation plan. The 2007 Modification Plan provides an opportunity to rectify this situation. As described above, two new areas are to be added to the Wildcat operational area; the expanded coal storage pad/drop zone and the material storage area. These areas are suitable areas to salvage additional topsoil. In addition, the new sediment ponds associated with the expanded facilities are also sites for additional topsoil salvage. By stripping excess topsoil from these combined areas during this phase of construction Andalex should be able to secure sufficient topsoil, when combined with the existing topsoil storage, to adequately reclaim the entire disturbed area with 6" as required by the approved plan.

Figures 13A, 13B and 13C show the existing topsoil volumes, the projected volumes of new topsoil piles associated with the 2007 Modification Plan, and the salvage source areas. In summary, the present piles contain about 17,000 yds. The existing topsoil deficit is now about 32,000 yards. By committing to salvage 24" of topsoil material from these new construction areas an additional 50,000 yds should be generated. This would be sufficient to not only reclaim the newly disturbed areas but to reclaim the present disturbed area as well. After the 2007 Modification Plan is constructed, there should no longer be a topsoil deficit.

At this time Andalex proposes to leave the existing substitute topsoil commitment (R645-301-224) in place in the plan. After the 2007 Modification Plan has been constructed the new topsoil piles will be surveyed and mapped, and exact volumes established. Assuming the topsoil deficit has been erased, Andalex will (with concurrence from the Division) eliminate the substitute topsoil section from the MRP at that time.

5) DIVISION ORDER DO-04, WIND-BLOWN FINES (REVIEW)

The requirements of the Division Order will be met through the following measures:

1) In-place topsoil presently affected by windblown fines will be salvaged and stockpiled farther away from the existing coal piles and stacker drop points. This involves removal of topsoil along a 150' swath downwind from the existing primary coal storage area. Field studies have shown that most of the wind-blown fines accumulation over the past 25 years of operation has occurred within this region.

2) This 150' swath will serve as a drop-zone for the possibility of future accumulations. Since topsoil will have been removed from this area, it will be reclaimed in the future by re-applying topsoil in accordance with the approved plan.

3) The drop-zone will be roughened and re-seeded after topsoil has been removed. This roughening will serve to minimize the downwind trans-migration of coal fines through the process of "ground hopping".

4) Newly established topsoil piles (located from 150' to 450' farther away from the existing stacker drop points) will be constructed with a 6" protective outer layer of additional suitable soil material, in the unlikely event that some coal fines still manage to make it to the new piles. The protective covering can be removed at time of final reclamation if it is determined that it has accumulated too many coal fines to be used as topsoil.

5) Prior to salvaging and stockpiling the topsoil within the drop-zone, excessive existing coal fines will first be removed, either by scraping with heavy equipment.

6) Andalex will extend the permit boundary to the east (in the direction of the wind-blown fines) within the newly acquired BLM right-of-way. Within this expanded right-of-way and permit area Andalex will construct a series of new sediment ponds and perimeter ditches designed to contain and confine any coal fines that might make it past the drop zone.

7) Andalex will hard-surface the truck haul road around the truck dump loop, where 99% of the truck traffic occurs during normal operations. Andalex will also relocate and gravel the

existing access road which runs around the outside of the existing coal storage pad, and sees limited but some truck traffic.

8) Andalex will establish a monitoring program to determine the extent of future wind blown fines, and evaluate the success of the implemented measures. Andalex will contract E.I.S Environmental Consultants to conduct a post-construction survey to be used as a baseline. These field surveys will then be done prior to each permit renewal and will employ similar protocol as the original survey (see Appendix U). E.I.S. will generate a report describing their findings and this report will be provided to the Division.

APPENDIX T

BLM RIGHT-OF-WAY
ENVIRONMENTAL ANALYSIS

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment UT-070-07-001
January 18, 2007

Wildcat Loadout Extension
UTU-48027

Location: T. 13 S., R. 09 E., Section 33: SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$.

*Applicant/Address: Andalex Resources, Inc., PO Box 902, Price, Utah
84501*

U.S. Department of the Interior
Bureau of Land Management
Price Field Office
125 South 600 West
Price, Utah 84501
Phone: (435) 636-3600
Fax: (435) 636-3657



**FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD
Wildcat Loadout Extension
EA UT-070-07-001
UTU-48027**

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that the action will not have a significant effect on the human environment. An environmental impact statement is therefore not required.

Decision:

It is my decision to authorize an amendment to the right-of-way grant to Andalex Resources, Inc. for the Wildcat Loadout Extension as described in the Alternative A - Proposed Action of EA UT-070-07-001. The company applied for right-of-way acreage increase of 150 acres on Federal Land. The company proposes to construct, operate, maintain, and terminate an extension of the existing Wildcat coal storage and loadout facility to facilitate collection and disposal of coal fines downwind from the storage and loadout facilities. I have determined that granting this right-of-way is in the public interest.

Rationale for the Decision: The decision to authorize the right-of-way has been made in consideration of the environmental impacts of the proposed action, as well as cost concerns to the Applicant. The action is in conformance with the Price River Management Framework Plan, which allows rights-of-way authorizations on a case-by-case basis. It is also consistent with the Carbon County Plan.

The No Action Alternative (Alternative B) was not selected due to the fact that Utah Division of Oil, Gas and Mining has issued a letter to the company ordering that the coal fines downwind be further contained. The No Action Alternative would not allow the company to comply with this order therefore threaten further operations of the present facility.

This NEPA action was posted on the BLM website on November 8, 2006. No comments were received from the public.

Roger L. Banker
Authorized Officer (signature)

1/22/07
Date of signature

Wildcat Loadout Expansion Project

EA No. UT-070-2007-01

1.0 PURPOSE & NEED

1.1 Introduction:

This Environmental Assessment (EA) has been prepared to analyze Andalex Resources, Inc. (ARI) Wildcat Loadout Expansion Project. The EA is a site-specific analysis of potential impacts that could result with the implementation of a Proposed Action (PA) or alternatives to the PA. The EA assists the Bureau of Land Management (BLM) in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts could result from the analyzed actions. "Significance" is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI).

1.2 Background:

ARI on behalf of Wildcat Loadout has filed a Notice of Intent (NOI) to acquire a Right-of-Way (ROW) for an additional 150 acres, in Carbon County, Utah. This ROW would be implemented in accordance with BLM Regulations and State of Utah. The proposed area covers federal land. ARI proposes to expand their ROW area and construct two drainage ditches that would flow into a central sediment pond for coal fine containment. Plate 1 shows the General Location. Plate 2 is the proposed location relative to the existing loadout boundary and US Highway (HWY) 191/6.

1.3 Need for the Proposed Action:

ARI needs to contain the coal fines within the project area. The area is currently permitted through the Utah Division of Oil, Gas and Mining and the BLM. The boundary would be modified to include the additional area to the south and east. Wind carried coal fines have lightly covered this area over the past 22 year history of Wildcat. Therefore, it is necessary to include this additional 150 acres as part of ARI's ROW area. It should be noted that this additional acreage would not be fully developed. ARI would possibly relinquish a portion of the ROW not required for development. It is also important to note that ConocoPhillips Company utilized part of the area as a coal bed methane well pad which has since been reclaimed.

1.4 Purpose of the Proposed Action:

Private production and transportation from federal coal leases is an integral part of BLM's coal leasing program under authority of the Mineral Leasing Act of 1920 as amended by Federal Land Policy and Management Act of 1976. The BLM Coal Leasing program encourages development of coal leases and the reduction of the United States dependence on foreign energy sources. BLM will consider approval of the proposed project in a manner that avoids or reduces impacts on other resources and activities as identified in the Price River Management Framework Plan (MFP).

1.5 Conformance with BLM Land Use Plan(s):

The PA is in conformance with the objectives of the MFP. Table 1.1 lists the pertinent objectives of the MFP that the PA is covered by and in conformance with.

TABLE 1.1 - PA Conformance with the Objectives of the MFP

Resource		Objective
Cultural	C-1	Protection and Promotion of Cultural Resource Values
Lands	L-2	Right-of-Ways and Land Use Permits
Range Management	RM-1	Allocation and Production of Grazing Lands
Recreation	R-1	Preservation and Protection of Visual Resources
	R-3	Value of Paleontological Resources – Negative Determination based on lack of suitable geologic layers.
	R-8	Maintenance of Undeveloped Recreation Resources
Watershed	W-2	Protection of Watersheds
	W-3	Protection and Enhancement of Water Quality
Wildlife	WL-1	Management of Mule Deer Habitat
	WL-8	Management of Raptor Habitat
	WL-9	Management of Non-Game Species Habitat
	WL-10	Special Management of Threatened, Endangered or Sensitive Species

1.6 Relationship to Statutes, Regulations, or Other Plans:

The area of the PA is located upon federal lands administered by the BLM Price Field Office (PFO). Various federal, state, local and private statutes, permits and easements will be required for actions associated with the proposed development.

The granting of the ROW by the BLM is pursuant to the requirements of Title 5 of the FLPMA, and regulations found within Title 43 of the Code of Federal Regulations (CFR),

part 2800. These requirements will cover all actions proposed that are off the coal lease area with the exception of portions of the existing road that may be considered a county road.

The ROW is directly tied to the processing of coal subject to coal leases and would be administered under both FLPMA and the requirements of the Mineral Leasing Act of 1920 (MLA), and regulations found within Title 30 of the CFR (U.S.C. 181-287). The proposed project is under the sole jurisdiction of the BLM, as it relates to Federal lands.

The area of the PA is zoned as MG-1, mining and grazing, by the Carbon County Zoning and Planning Office, and is consistent with the existing land use plan for the county.

TABLE 1.2 is a summary of the permits and approvals from federal, state and local agencies that ARI would need to obtain for the project.

TABLE 1.2 - Approval Summary: Federal, State And Local Agencies

Agency	Act or Regulation	Requirement
Federal		
Council for Environmental Quality	National Environmental Policy Act of 1969 (NEPA) as amended (40 CFR 1500) Public Law 91-90, 42 USC 4321	EA
Bureau of Land Management	Federal Land Policy Act of 1976 (FLPMA) (43 CFR 2800 & 3100) Public Law 94-579	ROW, NOP, TUP & Consultation
	Mineral Lease Act of 1920 Title 30; USC 181-287)	Mining Plan Approval
Fish & Wildlife Service	Endangered Species Act of 1973 (ESA) (16 USCC 1539)	Provide biological opinion of wildlife and plants that are federally listed & impacts of the PA to listed species.
	Migratory Bird Treaty Act (16 USC 703-711)	Consultation and review of impacts to listed species.
	Bald Eagle Protection Act (USC 663a)	Consultation and review of impacts to golden eagles.
State of Utah		
Department of Community & Economic Development		
Utah State Historical Society	National Historic Preservation Act (CFR 800, Sec. 106)	Consider NRHP eligibility and mitigation of cultural resources
Department of Environmental Quality		
Division of Air Quality	Permit to Affect Quality	Permit in place
Division of Water Quality	Construction And Operational Permits	Modification to UPDES & Storm Water Discharge Permits
Department of Natural Resources		
Division of Oil, Gas &	Permit for Mine and Reclamation	Mine plan amendment, approval and

Mining	(R645-301)	operation.
Carbon County	Site development permits and County Zoning Ordinances	Determine compliance with existing land use designation.

1.7 Project Initiation, Public Participation and Issues Identified for Analysis:

Project initiation was started with a request for ROW with the BLM PFO in September 17, 2006. Shortly after first applying for the ROW, the company asked the BLM to postpone the processing of the ROW until further notice. In August of 2006 the company informed the BLM to continue processing. Agency scoping was initiated on September 27, 2006. Through agency scoping all critical elements of the human environment and other resource concerns were considered and an Interdisciplinary Team Analysis Record Checklist (ITARC) was created (APPENDIX A). Agencies consulted are listed in CHAPTER 5.0. All resources considered to be not present in the project area or present in the project area but not impacted by the proposed project will not be discussed within this EA. However, rationale for these conclusions are indicated in APPENDIX A.

Public notice of the proposed project and preparation of the EA was posted on the BLM's Electronic Notification Bulletin Board on November 8, 2006.

Based on public and agency scoping, the following issues were determined to be relevant:

1.7.1 Soils.

1. Disturbance and or compaction of soil up to 2.34 acres.

1.7.2 Vegetation.

1. Loss of up to 2.34 acres of forage production.

1.7.3 Threatened, Endangered and Sensitive Species.

1. Potential loss of suitable habitat.
2. Potential loss of representative TE&S individual plant species.

1.7.4 Cultural and Historic Preservation.

1. Potential disturbance to cultural sites.

1.7.5 Wildlife.

1. Approximately 2.34 acres of disturbance on crucial winter range use area by deer.

1.7.6 Land Use and Grazing

1. Loss of forage production on 2.34 acres.

1.8 Summary:

This CHAPTER has presented the Purpose and Need the proposed project, as well as the relevant issues, i.e., those elements that could be affected by the implementation of the proposed project. In order to meet the purpose and need of the proposed project in a way that resolves the issues, the BLM would normally develop a range of action alternatives. In this case only the PA and a No Action Alternative are analyzed. This alternative, as well as a no action alternative, is presented in CHAPTER 2.0. The potential environmental impacts or consequences resulting from the implementation of each alternative are then analyzed in CHAPTER 4.0 for each of the identified issues.

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

2.1 Introduction:

This chapter describes the alternatives developed in response to the issues and concerns addressed in Chapter 1.0 and as identified within the scoping process

2.2 Alternatives Considered in Detail:

2.2.1 Alternative A – Proposed Action.

Andalex Resources, Inc. (ARI) currently maintains a ROW (U-48027) for the Wildcat Loadout (Loadout) on 100.350 acres of land utilized as a coal preparation and loading facility for a number of mines located within the area. Of the 100.350 acres, approximately 12.5 acres are under lease to Utah Railway (U-52065) by the BLM). The Loadout site is permitted under Utah Division of Oil Gas and Mining (UDOGM). The facility has three truck dumps, a unit train loading track, and numerous conveyor belts, as well as numerous structures to facilitate the reclaim, crushing, storage and loadout of coal.

The Loadout facility is located on federal land in Carbon County, Utah (Plate 1). The current ROW is not large enough to facilitate total coal fine containment (primarily airborne dust from the coal piles). ARI needs to expand their facility site to create two new drainage ditches that would run into a new sediment pond for coal fine containment. The area is located in Section (Sec.) 33, Township (T.) 13 South (S.), Range (R.) 9 East (E.) of the Salt Lake Base and Meridian (SLB&M) (Plate 1). The Wildcat Loadout Expansion Project would necessitate expanding the ROW to include the E $\frac{1}{2}$ SW $\frac{1}{4}$ and the entire SE $\frac{1}{4}$ of Sec. 33, approximately 98 acres.

In the event the pond required decanting, a gas powered pump would be utilized. The pond would act as a retention basin to capture surface deposits of coal fines that currently could enter the existing drainages. The coal fines would be removed periodically or when the material reaches 60 percent of designed capacity. The fines would be hauled to an approved UDOGM refuse disposal site. The existing natural drainages serve as an undisturbed bypass to allow runoff from adjacent undisturbed land to bypass the pond.

It is important to note that a portion of the area is a recently reclaimed well pad location leased by ConocoPhillips Company. Roads within the project area would require no upgrading. No new fencing or culverts would be installed.

Construction of Storm Drainage – The Proposed Project would create two drainage ditches located inside of the 2 large natural washes (Plate 2). These drainage ditches would be approximately 36 inches deep with a 2:1 side slope (approximately 20 feet in width)(Figure 1). The southern most ditch would be approximately 1,930 feet (0.88 acres) in length and the northern most ditch would be approximately 2,067 feet (0.94 acres) in length. Construction of the ditches would require the utilization of a conventional trackhoe and road grader for a period of three to five days.

The two drainage ditches would meet at a central sediment pond. The approximate size of the pond would be 150 feet by 150 feet (0.52 acres) with an embankment approximately 10 feet in width and 11 feet in height. The pond may necessitate the use of a D-6 class crawler tractor. The pond is designed to contain all runoff from the lands encompassed by the existing natural drainages (Figure 2). The pond would be constructed in the lowest quadrant of the ROW area whereby most loadout site disturbed area drainage would drain into the pond. The capacity of the pond would be well in excess of the 10-year, 24-hour precipitation event requirement.

One advantage of the pond is its proposed location adjacent to the roadway. This would greatly simplify sediment monitoring and cleanout. The culverted primary spillway would be constructed with an oil skimmer and built to pass the 10-year, 24-hour storm event. The emergency spillway would be lined with concrete or grouted rip-rap and have a bottom width of two feet; a freeboard depth of two feet and 2:1 side slopes and capable of handling a 25-year, 24-hour storm event. Riprap would be installed at the outlet of the open channel spillways to protect the earthen structures from erosional forces.

Topsoil Removal, Salvage and Stockpiling – Available soil over the area ranges from about 6 to 8 inches, of which an average soil layer of about 8 inches thick would be removed and stockpiled as topsoil. The upper 6 to 12 inches is the most suitable soil, however, the subsoils over much of the area support root growth to depths of about 48 inches. Topsoil would be salvaged with backhoes, trackhoes and/or front-end loaders and hauled by dump trucks to the designated topsoil storage area within the disturbed area. As much as 2,129 cubic yards of topsoil could be salvaged.

The topsoil storage area is proposed in the southeast corner of the facilities site near the sediment pond. The stockpile would be protected from erosion and sediment production by roughening the surface, revegetation, berms and silt fences. Subsoil materials would be used over the area for facilities site development and then retrieved for soil reconstruction during reclamation.

Stabilization, Maintenance and Operation Plan – Construction procedures would be consistent with those described within the Utah Nonpoint Source Best Management Plan for Hydrologic Modification. Where runoff and drainage controls would be required, they would be constructed to BLM standards. The hydrologic regime would be protected by the installation and implementation of protection measures at all proposed drainage modifications.

Maintenance would include the periodic cleaning of the pond and drainage control ditches in order to maintain their function. Clean out material would be disposed of off-site in an approved solid waste disposal facility, such as East Carbon Development Corporation (approximately 30 miles southwest of the surface facility). A Spill Prevention Control and Countermeasure Plan (SPCC Plan) has been developed to protect the undisturbed drainages from accidental spills of oil or other petroleum products within the disturbed area. This plan would be available for review at the loadout site.

In the event of spills of petroleum-based products during the construction of the PA, procedures outlined in the SPCC Plan would be followed. The BLM, as well as the Utah Department of Environmental Quality, would be notified if the release meets the definition of a hazardous waste as defined in 40 CFR 261.

To maintain the cultural, historical and paleontological resource integrity of the area, construction crews and staff would be provided with instructional materials regarding the identification, value, legal protection and treatment of these resources. If any cultural, archeological or paleontological resources are discovered during construction or any operations associated with the railroad, conveyor or surface loadout facilities, all activities would cease at the area of the manifestation. The authorized agency would then be contacted to evaluate the importance and potential of the site. Mitigation measures would, at that time, be made for the value of the resource site. Construction and/or maintenance crews would avoid the site until the resource potential has been determined.

Potential measures to help improve air quality for construction activities include proper maintenance of the construction equipment and limited travel on the construction ROW and dirt access roads. Dust generation from disturbed areas would be reduced through interim watering of active construction areas. An enzyme armor coating on the access road would minimize dust generated by traffic during construction or eliminating it all together. Final

reclamation, which included revegetation of all disturbed areas, would eliminate further impacts.

Vegetation removal necessitated by the PA would be confined to the ROW. Vegetation removed would be set-aside during construction activities, and/or left in place upon completion of construction where possible. Reclamation would be completed as stated in the Wildcat M&RP.

Prior to construction and operation of the PA, an awareness and appreciation of wildlife would be taught to all employees associated with the project. All activities associated with the PA development would be coordinated to avoid optimal habitat use periods and areas for all wildlife species. The May 2006 raptor survey conducted by the Utah Division of Wildlife Resources did not find any active nests within 0.5 mile of the proposed project area. However, if active/occupied raptor nests are located within 0.5 mile of any portion of the project area, construction would not begin within that area during the period of February 1 to July 15.

Abandonment and Reclamation The existing Wildcat Loadout Facility would be reclaimed according to the M&RP.

2.2.2 Alternative B – No Action.

Under the No Action Alternative, the ROW would not be issued and ARI would continue to periodically clean-up coal fines with a vacuuming system (Wildcat M&RP, UMC 784.11 Section 5.2). In addition, the potential for coal fines to be washed into the two natural drainages would continue.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction:

This CHAPTER presents the potentially affected existing environment (i.e., the physical, biological, and socioeconomic values and resources) of the impact area as identified in the Interdisciplinary Team Analysis Record Checklist (ITARC) (APPENDIX A) and presented in CHAPTER 1.0 of this assessment. This CHAPTER provides the baseline for comparison of impacts/consequences described in CHAPTER 4.0.

In order to analyze potential impacts, both positive and negative, an understanding of what currently exists at the location is essential. Only those resources, which could be affected, will be discussed. The balance of the resources within the area are itemized in APPENDIX A and dismissed from analysis.

3.2 General Setting:

Elevations in the area of the PA ranges from 6,000 feet to 6,300 feet above sea level and is characterized by hot, dry summers and cold, moist winters. Most of the available water results from winter snow accumulation. Summer precipitation comes from short duration thunderstorms, which often result in flooding and erosion (Lines et al, 1984). Characteristic vegetation includes scattered pinyon-juniper over most of the bench area intermixed with shrubs and grasses. The general area is predominantly a disturbed setting, with several dirt roads and routes constructed for grazing and mineral exploration activities meandering through the area and numerous coal bed methane well pads located within the surrounding area.

The Wildcat Loadout facility is located within the Gordon Creek area of the Wasatch Plateau, which is one of the major physiographic features in the region. The plateau rises from a base at approximately 6,000 feet in elevation to over 9,000 feet. The project area is characteristic of the mid-elevations of the province, consisting of deep rugged washes and open plateaus. The permit area sits on the Masuk Member of the Mancos Shale. The Mancos Shale in this area is in excess of 5,000 feet thickness. The Mancos Shale in the area is mainly dark bluish, gray shale, which becomes sandy towards the top (Wildcat PAP). The oldest unit of the Mesa Verde Group is the Starpoint Sandstone. It lacks coal and consists of three sandstone tongues. The beds of sandstone range in thickness from one to ten feet in most parts. The Mesa Verde Group immediately overlies the Mancos Shale. Beds are mostly uniform and are inclined from three to eight degrees away from the uplift. The strike of the beds is generally parallel to the face of the cliff. Members of the Price River Formation and Upper Cretaceous Blackhawk Formation are evident in the area. The Castlegate Sandstone is approximately 450 feet thick in this area.

3.3 Resources/Issues Brought Forward for Analysis Including Critical Elements of the Human Environment:

3.3.1 Soils.

Soils in the project area have been mapped at the order 3 intensity level by the Soil Conservation Service, (now the Natural Resource Conservation Service, NRCCS), as part of the Soil Survey of the Carbon Area, Utah, 1988. This soil survey is presently in a published soil survey meeting national quality standards. An Order 1 soil survey was completed at the Wildcat Loadout facility site in 1988. The detailed soil survey report is contained within the M&RP, which includes the entire existing area. The soil map units identified are those as described by NRCS as of June 2002. Soil map units identified by the NRCS that are within the project area are listed below:

- 48 Haverdad Loam, Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents.
- 52 Hernandez Family, Fine-loamy, mixed, superactive, mesic Ustic Haplocalcids.
- 120 Travessilla- Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents.

Haverdad Loam. The Haverdad series consists of very deep, well-drained soils formed in stratified alluvium on flood plains and low terraces. Elevations range from 3,500 to 6,500 feet. Permeability is moderate. Slopes range from 0 to 6 percent. The mean annual precipitation is approximately 11 inches, and the mean annual temperature is approximately 45 degrees F. Parent material is alluvium from mixed sources. Well drained; slow runoff; moderate permeability. Flooding for brief periods occurs during spring runoff and after thundershowers.

A--0 to 4 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots throughout; carbonates are disseminated throughout; slightly effervescent; moderately alkaline (pH 8.0); gradual smooth boundary. (2 to 8 inches thick)

Cl--4 to 14 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots throughout; carbonates are disseminated throughout; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C2--14 to 30 inches; pale brown (10YR 6/3) loam, stratified with fine sandy loam, sand loam, clay loam, and silt loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; slightly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

C3--30 to 60 inches; pale brown (10YR 6/3) clay loam, stratified with fine sandy loam, loam, silt loam, and silty clay loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots throughout; carbonates are disseminated throughout; slightly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

Hernandez Family. Hernandez soils are on upland fans and ridges and have slopes of 0 to 5 percent. Elevations range from 7,000 to 8,000 feet. The soils formed in moderately fine textured alluvium. The mean annual precipitation is about 11 to 13 inches of which approximately 8 inches falls during the period from May through October as intense thunderstorms. The remainder occurs mainly as snow during the period November through April. The mean annual temperature is about 46 degrees to 48 degrees F. The frost-free season is 125 to 135 days. Well-drained; medium to slow runoff; moderate permeability.

A--0 to 4 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; moderately calcareous; slightly alkaline (pH 7.8); clear smooth boundary. (1 to 5 inches thick)

Bw--4 to 14 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots;

common very fine and fine tubular pores; moderately calcareous; slightly alkaline (pH 7.8); clear smooth boundary. (6 to 14 inches thick)

Ck1--14 to 45 inches; pink (7.5YR 8/4) clay loam, light brown (7.5YR 6/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; strongly calcareous, with disseminated lime; moderately alkaline (pH 8.2); gradual smooth boundary. (20 to 40 inches thick)

Ck2--45 to 60 inches; pink (7.5YR 7/4) clay loam, brown (7.5YR 5/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; common very fine tubular pores; strongly calcareous, with disseminated lime; moderately alkaline (pH 8.2).

Travessilla. The Travessilla series consists of very shallow and shallow, well drained soils that formed in calcareous eolian sediments and material weathered from sandstone. These soils are on hills, cuestras, scarps, and mesas with slopes ranging from 0 to 75 percent. Mean annual precipitation is approximately 11 inches. The mean annual temperature is above 53 degrees F. Typically, moist intermittently from April 30 through October in some part of the soil moisture control section and dry in all parts periodically from November 1 to April 30. Well drained; runoff is high on slopes less than 1 percent and very high on slopes greater than 1 percent; moderate or moderately rapid permeability.

A--0 to 4 inches; light brownish gray (10YR 6/2) stony sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and medium roots; common fine pores; 15 percent stones; slightly effervescent; slightly alkaline; clear smooth boundary. (2 to 6 inches thick)

C--4 to 8 inches; pale brown (10YR 6/3) channery loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine pores; 20 percent channers; slightly effervescent; moderately alkaline; abrupt smooth boundary. (2 to 14 inches thick)

R--8 inches; hard sandstone with some fractures.

3.3.2 Vegetation.

The proposed project area contains plant communities common to this area of Utah. The area is predominately covered by big sagebrush (*Artemisia tridentata wyomingensis*), Indian ricegrass (*Achnatherum hymenoides*), Utah juniper (*Juniperous utahensis*) and Pinyon pine (*Pinus edulis*). Other species located within the project area include galleta (*Hilaria jamesii*), winterfat (*Eurotia lanata*), pricklypear cactus (*Opuntia sp.*), needle and thread grass (*Hesperostipa comata*), Salina wildrye (*Leymus salinus*), halogeton (*Halogeton glomeratus*) and Russian Thistle (*Salsola tragus l.*). Halogeton and Russian thistle mainly cover the reclaimed well pad and road area (approximately 1.25 acres).

Areas of pinyon pine and Utah juniper are scattered throughout but become much smaller as the route enters the area dominated by sagebrush and grass.

3.3.3 Threatened, Endangered and Sensitive Species.

The area has potential habitat and suitability criteria for two flora species- Creutzfeldt cryptantha (*Cryptantha creutzfeldtii*) and Uinta Basin hookless cactus (*Sclerocactus glaucus*); three avian species- Northern Goshawk (*Accipiter gentiles*), greater sage-grouse (*Centrocercus urophasianus*) and burrowing owl (*Athene cunicularia*); three mammal species- kit fox (*Vulpes*

Macrotis), White-tailed prairie-dog (*Cynomys leucurus*), and black-footed ferret (*Mustela nigripes*); no reptiles, fish and/or amphibians of special interest would occur within the project area. There is suitable habitat for both neo-tropical and migratory birds.

In accordance with the United States Fish and Wildlife Service's (USFWS) protocols an inventory for the habitat suitability presence of threatened, endangered and candidate fauna and floral species was conducted on September 27, 2006 (APPENDIX B, Habitat Delineation).

3.3.4 Cultural and Historic Preservation.

The culture history for the current project area is an extension of that described for the Price Coalbed Methane Gas project in the Final Environmental Impact Statement (BLM 1997a) That document describes the 12,000-year culture History for the entire field. That document is supplemented by the Cultural Resource Management Plan, which provides guidance for evaluation and treatment of cultural resources discovered during intensive cultural resource inventories in the areas of potential effect from the proposed undertaking (Späth 1999). The CRMP has been formalized in a Programmatic Agreement (BLM 1997b).

SENCO-PHENIX conducted an extensive file search at the BLM Field Office in Price, Utah and also consulted the early GLO maps (1930) and the early U.S.G.S. map (1916). SENCO-PHENIX then surveyed ca. 55 acres within the project area. The remaining 43 acres has been covered by previous archeological surveys (Senulis 2000, 2001; Mrstik and Montgomery 2005). No new cultural resources were discovered by the current survey (Senulis 2006).

Archeological sites or districts are eligible for the NRHP under the following criterion:

Criterion A: Event. This refers to a specific event such as the founding of a town or a series of events such as the development of a lifestyle. (NPS: Bulletin #15:11-13) The Utah Railway (42CB1258) built in 1912 to 1914 is eligible under this criterion for its significance to the economic development of the Price Basin. The Utah railway is west of the current project area and will not be impacted by this project.

Criterion B: Person. This criterion applies to individuals who can be determined to be significant in our past. (NPS: Bulletin #15:14-16) There are no sites near the project area that meet this criterion.

Criterion C: Design/Construction. This criterion applies to properties "significant for their physical design." (NPS: Bulletin #15:17-20) There are no sites near the project area that meet this criterion.

Criterion D: Information Potential. This criterion has two requirements, which must both be met for a property to be eligible. The property must have information to contribute to our understanding of human history or prehistory. This information must also be considered important. (NPS: Bulletin #15:21-24) There are no sites near the project area that meet this criterion.

3.3.5 Wildlife.

Wildlife indigenous to the general area of the project includes amphibians, reptiles, birds and mammals. The area is located east of the Wasatch Plateau, a region that supports approximately 360 vertebrate wildlife species. The abundance and distribution of wildlife in the proposed project area is directly related to the present land use and capabilities. The vegetation in this area provides crucial winter range for mule deer and greater sage grouse.

Reptiles & Amphibians The most prominent species of reptiles include the rattlesnake and various lizard species. The pinyon/juniper and sagebrush/grass areas that make up most of the affected habitat are not considered important or limiting to their survival. No aquatic fauna are present within the area; therefore, reptiles and amphibians will not be discussed further.

Fish. There are no permanent bodies of water or perennial streams within the area, therefore no fish species would be affected.

Raptors. A variety of raptors occupy the surrounding area, however all of the located nest sites are more than 0.5 mile from the proposed project area. The May 2006 raptor survey conducted by UDWR did not reveal any active or tended nest sites within a 1-mile buffer of the proposed project site (Plate 3).

The proposed project is located within crucial winter and brooding range for greater sage grouse. This species is usually inhabits the sagebrush flats at the foot of the cliffs.

Mammals. The main game species include mule deer, mountain lion, blackbear and elk.

Mule Deer. Mule deer habitats within the affected area is considered crucial winter range. Mule deer population densities within this herd unit are well below management objectives.

Mountain Lion. Mountain lion area present but their movement generally coincides with the migration of deer. This species will not be discussed further.

Black Bear. Black bear may occasionally be found in the vegetated canyons, usually along the cliff faces. This species will not be discussed further.

Elk. The project area is not within the limits of elk range. Therefore, this species will not be discussed further.

3.3.6 Land Use and Grazing.

One grazing allotment occurs within the vicinity of the project area. The existing gas field access road and proposed Wildcat Loadout Expansion Project would occur within the Consumers Wash Allotment. The current permittees are Pete and Steve Stamatakis. The season of use is during the winter and spring from October 1 to June 20 with 874 head of sheep currently using 434 animal unit months (AUM's).

4.0 ENVIRONMENTAL IMPACTS

4.1 Introduction:

This CHAPTER describes the possible impacts to the resources as a direct/indirect result of the change agents associated with the alternatives developed in response to the issues and concerns addressed in CHAPTERS 1.0 and 3.0 and as identified within the scoping process.

4.2 Direct/Indirect Impacts:

Direct Effects: Effects caused by the action and occur at the same time and place.

Indirect Effects: Effects caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Cumulative Impacts: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.2.1 Alternative A – Proposed Action.

TABLE 4.1 shows how activities associated with the proposed project (construction and operation of the proposed project for the loadout surface facility on federal lands affect the resources described in Chapter 3 and as identified during the scoping process.

TABLE 4.1 - Areas of Impact Associated With the PA

Category	Area (acres)	Remarks
Soils	2.34	Construction & Operational Disturbance
Vegetation	2.34	Construction & Operational Disturbance
TES Species	2.34	Construction & Operational Disturbance
Cultural & Historic Preservation	2.34	Construction & Operational Disturbance
Wildlife	2.34	Direct Construction & Operational Mule Deer Habitat Disturbance

	2.34	Direct Construction & Operational Raptor Foraging Habitat Disturbance
Land Use & Grazing	2.34	Direct Construction & Operational Grazing Habitat Disturbance

4.2.1.1 Soils. The combined construction impact to soil resources from the proposed project would be 2.34 acres. This includes the entire proposed disturbance associated with the drainage ditches and sediment pond. In association with the pond and drainage construction the removal of vegetative cover would result in an increased susceptibility to soil erosion throughout the disturbed sites.

A temporary impact to soil could occur within the ROW where construction vehicles would compact topsoil layers by gaining access within the ROW for construction activities. A temporary loss in soil productivity could occur on the sites during the life of the loadout facility. Upon reclamation, the area would be returned to approximate natural conditions, with soil functioning being a major consideration. Within the proposed project ROW, surface disturbance to soil resources at specific structure sites would be minimal (2.34 acres).

4.2.1.2 Vegetation. As previously discussed, the area of the proposed project could compromise as much as 2.34 acres. Vegetation and habitats impacted are not limited, nor specific to the project area. Therefore, the acreage of impact would not affect the health of the local community structure.

Impacts to vegetation populations would be minimal and limited to activities associated with construction of the drainage ditches and sediment pond. Disturbance to recently reclaimed areas would be temporary, from 24 to 36 months and/or until vegetation becomes fully established. No long-term impact to vegetation resources is expected from the proposed project.

TABLE 4.2 - Habitat Disturbance Associated with the PA

Area	Construction (Acres)	Operation (Acres)
Northern Drainage Ditch	0.94	0.94
Southern Drainage Ditch	0.88	0.88
Sediment Pond	0.52	0.52
Total Acreage:	2.34	2.34

4.2.1.3 Threatened, Endangered and Sensitive Species. Impacts directly associated with the proposed project, due to the limited disturbance, would be minimal and limited to activities associated with construction of the drainage ditches and sediment pond. A TES habitat delineation of the area of potential disturbance did not reveal the presence of any TES species. Suitable habitat was found to be present for two flora species- Creutzfeldt

cryptantha and Uinta Basin hookless cactus; three avian species- Northern Goshawk, greater sage-grouse and burrowing owl; three mammal species- kit fox, White-tailed prairie-dog, and black-footed ferret; no reptiles, fish and/or amphibians of special interest would occur within the project area. There is suitable habitat for both neo-tropical and migratory birds. However, this same habitat is abundant throughout the region and is not a limiting factor to the spread or propagation of these species. No suitable Mexican spotted owl habitat is located within 0.5 miles of the PA.

4.2.1.4 Cultural and Historic Preservation. The FEIS (BLM 1999, supplemented by the Cultural Resource Management Plan (Späth 1999), provides guidance for evaluation and treatment of cultural resources discovered during intensive cultural resource inventories in the areas of potential effect from the proposed undertaking. The preferred option for managing cultural resources is avoidance of the resource (Späth 1999:17).

The Utah Railway (42CB1258) built in 1912 to 1914 is eligible for the NRHP under criterion (a) event, for its significance to the economic development of the Price Basin. The Utah railway is west of the current project area and will not be impacted by this project.

Because of the above, a finding of no effect to historic properties is appropriate and archeological clearance is recommended.

4.2.1.5 Wildlife. The primary concerns relative to wildlife within the area of the PA are:

1. Direct impacts, which include surface disturbance resulting in the loss of habitat, key habitat components and/or direct mortality to wildlife.
2. Indirect impacts which result is loss of habitat suitability resulting from intrusion of human presence and activity within sensitive wildlife habitats.

Direct impacts of the proposed project include surface disturbance required for drainage ditch and sediment pond installation and direct mortality associated with subsequent traffic. Indirect impacts of the proposed project include human related intrusions/disturbances into wildlife habitats, which can cause loss of habitat suitability. Human related intrusions/disturbances include human presence, equipment operation and construction activity. These intrusions can in turn result in reductions in use of habitat by wildlife and changes in distribution and movement patterns by wildlife. Loss of habitat suitability becomes particularly important when it affects habitats of species known to be sensitive to such intrusions or occurs during critical periods of the year when wildlife are more vulnerable to these adverse impacts (i.e., critical range, nesting).

Raptors. Direct operational surface disturbance would affect approximately 2.34 acres of raptor foraging habitat. This loss in itself is not expected to adversely effect raptors. Raptors are known to be sensitive to human intrusion during the nesting cycle. Disturbances during this period of time can cause birds to abandon their nesting territories or disrupt

adults tending the young in the nest resulting in mortality of young in the nest. However, the 2006 spring inventory did not identify active and/or tended raptor nests within a mile of the proposed site.

Mule Deer. Direct surface disturbance associated with operation of the PA would affect approximately 2.34 acres of mule deer crucial winter range. Mule deer crucial winter range supports relatively large population densities, however, the small loss of habitat (2.34 acres) is not expected to have any noticeable effect on numbers or distribution patterns for this species. Distribution of mule deer on these winter ranges could be affected, particularly in years with heavy snow conditions and during the early and late winter periods when snow is absent. Mule deer are vulnerable to disturbances of human activity when concentrated on winter ranges and animal physical conditions are depleted. Indirect impacts of the proposed project should have little effect on mule deer.

4.2.1.6 Land Use and Grazing. Livestock would be allowed on the allotment described. Upon operation activities, livestock would be precluded during the life of the project on 0.52 acres associated with the proposed sediment pond. New fencing would be installed as a result of the proposed project and a slight reduction of current AUM numbers are anticipated.

The Consumers Road is fenced along the south side, which creates two pastures. The north side is a winter grazing pasture and the south side is a spring grazing pasture. The allotment is grazed with sheep, at present. Steve Stamatakis has made application to change grazing in the south pasture to cattle use. (Jensen, 2006)

Mapping in 1993, in the south pasture show that the prevailing winds have blown coal dust from the loadout facility in a southeasterly direction. Also, coal dust has been deposited along the Consumers road from the coal haul transport trucks associated with the loadout. The coal dust had affected vegetation on 60 acres of public land at that time. The coal dust affects the microclimate of the soil. The covering of the black coal particles results in increased soil temperatures and causing increased evaporation of moisture resulting in drier soil conditions. There has been a significant change in the vegetation on the site. Sagebrush has been reduced and Winterfat has increased. Cool season grasses have reduced and mid to warm season grasses have increased. This has resulted in a reduction in the critical winter habitat for mule deer on the affected acreage.

As part of the original coal loadout lease agreement, Andalex completed an off-site vegetation mitigation project on other public lands. The project consisted of interseeding high value browse plants into the existing plant community on 50 acres at two different locations. One site was just west of the Consumers loadout facility and the other was on Porphyry Bench, south of Gordon Creek. The sites had

previously been chained and then seeded with grasses, specifically for spring livestock grazing.

The interseeding was designed to increase plant diversity and production of high value browse species on the lower elevation winter deer and elk range. Studies initially showed an increase in browse diversity from one to four different species and density increased from 600 to 3,500 plants per acre. These mitigation sites have been heavily grazed by wildlife. Grasses have continued to dominate these sites. Present density of the browse plantings is not known, however they have continued to receive heavy grazing pressure.

On April 14, 2005, BLM GPS mapped and took general photographs of the affected coal dust area. Map calculations show 59 acres directly affected and photos show the depth of the coal dust and vegetation type and condition.

In the fall of 2005, the Utah Partners for Conservation and Development (UPCD), a group of 15 federal, state and private conservation land management agencies funded a wildlife sagebrush winter habitat restoration project on the Consumers Wash allotment. The project was located south of the affected coal dust area between the coal loadout and Gordon Creek. Andalex was not asked to participate in this project. The project consisted of planting approximately 200 acres, using a Lasso airator, to chop and interseed strips of sagebrush, forbs and some grasses to restore browse habitat. The project was undertaken to due a die-off of winter sagebrush habitat on the past several years.

4.2.1.7 Mitigation Measures. The monitor plan stated in the CRMP (Späth 1999), as amended, provides a means to assess impact to significant resources. No significant resources will be directly impacted by the proposed construction activities. No other mitigating measures other than those incorporated into the Wildcat Loadout M&RP have been identified unless listed below.

4.2.1.8 Monitoring and/or Compliance. ARI has committed to monitoring during the reclamation portion of the project according to the M&RP. BLM and UDOGM personnel would approve the reclamation upon completion and conduct annual inspections until the area is deemed fully reclaimed or identify areas, which may require additional work to accomplish the reclamation standard of success prior to bond release.

4.2.2 Alternative B – No Action.

If the No Action alternative were selected, the proponent would not be authorized to implement the project. Therefore, no direct, indirect, or cumulative impact would occur to soils, vegetation, threatened, endangered and sensitive species, cultural and historic preservation, wildlife or land use and grazing.

4.3 Cumulative Impacts Analysis:

"Cumulative impacts" are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

4.3.1 Reasonably Foreseeable Action Scenario (RFAS).

The following reasonably foreseeable action scenario (RFAS) identifies the actions that would cumulatively affect the same resources in the cumulative impact area as the PA and alternatives. The following RFAS was compiled based on past/present activities:

Coalbed Methane Development. Development of the area for coalbed methane includes the Price Coalbed Methane Project Final Environmental Impact Statement (PCMP FEIS), which surrounds the proposed action, as well as development of the area described in the Ferron Natural Gas Project Final Environmental Impact Statement (FNGP FEIS) located east of the proposed action. Between the two projects and the companies that make up the development, as many as, as many as 1,700 wells could be drilled over the next 20 years. Included within this reasonably foreseeable development would be the construction and operation of additional transportation and utility corridors to facilitate the operation and development of the gas fields.

The physical presence of man and equipment could result in added traffic, which could result in vandalism to cultural sites. The loss of the data from undiscovered cultural sites could be a cumulative impact of this action.

Coal Mining and Related Activities. The Wildcat Loadout Facility receives coal transported by heavy truck on a 24-hour basis on the Consumers Road from many of the mines within the region.

Coal brought to the Wildcat Loadout is prepared and sorted to be loaded and transported via the Utah Railway Line that runs just north of the proposed action area.

The Consumers Road also is used as an access to the underground coal Horizon Mine and 20 acre disturbed area associated with its surface operations. This facility is located approximately nineteen miles northwest of the proposed action area. Coal produced by this operation is transported to the Wildcat Facility.

4.3.2 Cumulative Impacts.

A cumulative impact, as defined within 40 CFR 1508.7, is the impact on the environment which results from the incremental impact of the action (proposed action) when added to other past, present and RFAS. To assess the cumulative impacts of the proposed action, it is necessary to identify those components of the environment that could be affected that were

not minimized by actions taken as part of the PCMP FEIS and proposed action scenario or mitigated upon review of direct and indirect impacts of the proposed action. Specific issues raised during scoping form the basis of review of cumulative impacts.

Direct and indirect impact to resources would be minimal. Development of the proposed action would not result in any other additional disturbance to described resources. The construction of the proposed projects will not open the area to increased traffic and recreational use and will have no cumulative impact on cultural resources. Actions taken as part of the proposed action, as well as mitigation outlined in the Wildcat Loadout Facility M&RP and stipulations as part of UDOGM and BLM permits for erosion control, protection of resource values, reclamation and revegetation to minimize impacts have eliminated the need for mitigation of area wide cumulative impacts.

5.0 CONSULTATION AND COORDINATION

5.1 Introduction:

The issue identification section of CHAPTER 1.0 identifies those issues analyzed in detail in CHAPTER 4.0. APPENDIX A provides the rationale for issues that were considered but not analyzed further. The issues were identified through the agency involvement process described in sections 5.2 and 5.3 below.

5.2 Persons, Groups, and Agencies Consulted:

5.2.1 Federal Government/Agencies.

- U.S. Department of Agriculture
 - Natural Resource Conservation Service - Soil Resources
- U.S. Department of the Interior
 - U.S. Fish and Wildlife Service - Threatened and Endangered Species and Raptors

5.2.2 State of Utah.

- Department of Community and Economic Development
 - State Historical Preservation Office - Cultural Resources
- Department of Natural Resources
 - Division of Oil, Gas and Mining - Mine Plan and Resource Analysis
 - Division of Water Rights - Water Rights
- Division of Wildlife Resources - Wildlife Resources

5.2.3 Local Governments and Organizations.

- Carbon County Recorder - Land Use and Resource Analysis
- Carbon County Planning and Zoning - Land Use and Zoning
- Carbon County Commissioners - Land Use and Easements

5.2.4 Industry and Business.

- SENCO-PHENIX; Price, UT - Cultural Resources
- Blackhawk Engineering; Helper, UT - Ditch & Pond Design
- Andalex Resources, Inc.; Price, UT - PA

5.3 List of Preparers:

5.3.1 BLM Price Field Office: Price, Utah.

Name	Title	Responsible for the Following Section(s) of this Document
Mike Robinson	Realty Specialist	Project Manager / Realty Specialist
Blaine Miller	Cultural Specialist	Cultural Resource Specialist
Brad Higdon	NEPA Coordinator	NEPA Coordinator
David Waller	Wildlife Biologist	Wildlife Biologist
Jeff Brower	Hydrology Specialist	Hydrologist
Karl Ivory	Range Management Specialist	Threatened, Endangered & Sensitive Species, Natural Resource Specialist
Mike Tweddel	Range Specialist	Wild Horse and Burro Specialist

5.3.2 EIS Environmental & Engineering Consulting: Helper, Utah.

Name	Title	Responsible for the Following Section(s) of this Document
Katie J. Nash	TES Specialist	Project Manager/ Impact Analysis / Maps
Melvin A. Coonrod	Principle Consultant	Impact Analysis / Construction / Reclamation
David Basinger	Botanist	Vegetation and Habitat
Dean Nyffeler	Geologist	Soils
J.T. "Tom" Paluso	Chief Engineer	Hydrology
DeeAnn Finger	Admin. Assistant	Editing and revisions
Phil Jensen	Director of Drafting Operations	Drafting

6.0 REFERENCES, GLOSSARY AND ACRONYMS

6.1 References Cited:

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Senulis, John A. 2006 An Intensive Cultural Resource Survey and Inventory of the Wildcat Loadout Expansion Area, SENCO-PHENIX Archeological Consultants, Price, Utah (Pending).

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Späth, Carl. 1999 *Ferron Natural Gas Development Plan for Cultural Resources (CRMP)*, as modified and adopted by Phillips Petroleum Company February 23, 2001, Price, Utah.

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6.2 Glossary of Terms:

Access	Road used for passage to proposed project
Affected Environment	The biotic, abiotic, and human-related environment that is sensitive to changes due to the actions propose in any of the alternatives.
Agency	The land management agencies, in this case the BLM and OSM.
Allotment	A unit of land suitable and available for livestock grazing that is managed as one grazing unit.
Alluvium	A general term for all detrital deposits resulting from the operations of modern rivers, including the sediments laid down in riverbeds, floodplains, lakes and fans at the foot of mountain slopes and estuaries.
Alternative	Other reasonable courses of action to any proposal, which involves unresolved conflicts, concerns or alternate uses of available resources.
Ambient (air)	The surrounding atmospheric conditions.
Animal Unit Month	For the BLM allotments, it is the forage consumed by a 1,000-pound cow over a one-month period, approximately 800 pounds of forage. An animal unit month is then multiplied by 1.32 for a cow/calf operation and is equivalent to an animal month for purposes of this document.
Archaeology	The science that investigates the history of peoples by remains belonging to the earlier periods of existence.
Assessment	An evaluation of existing resources and potential impacts to them from a proposed act or change to the environment.
Background	The viewing area of a distance zone that lies beyond the foreground - middle ground. Usually from a minimum of 3 to 5 miles to a maximum of about 15 miles from a travel route, use area, or other observer position. Atmospheric conditions in some areas may limit the maximum to about 8 miles or increase it beyond 15 miles.
Commitment (mitigation)	Obligation to a measure that would diminish the severity of an impact.
Community	A group of one or more populations of organisms that form a distinct ecological unit. Such a unit may be defined in terms of plants, animals or both.
Contrast	The effect of a striking difference in the form, line, color, or texture of the landscape features within the area being viewed.
Corridor	A continuous trace of land of defined width.
Cultural Resources	The archeological and historical remains of human occupation or use. Includes any manufactured objects, such as tools or buildings. May also include objects, sites, or geological/ geographical locations significant to

Native Americans

Cumulative Effects

As defined in 40 CFR 1508.7, cumulative effects are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Direct Impacts

As defined within 40 CFR 1508.9, these are the effects, which are caused by the action and occur at the same time and place as the action. Synonymous with direct effects.

Emergent (vegetation)

Vegetation coming into existence.

Endangered species

Any species in danger of extinction throughout all or a significant portion of its range as identified by the Endangered Species Act of 1973 (ESA). This definition excludes species of insects that the Secretary of Interior determines to be pests and whose protection under the ESA would present an overwhelming and overriding risk to man.

Environment

The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.

Environmental Assessment

A concise public document which serves to a) Briefly provide sufficient evidence and analysis for determining whether to prepare and EIS or a Finding of No Significant Impact, b) Aid an agency's compliance with NEPA when no EIS is necessary, c) Facilitate preparation of an EIS when necessary.

Ephemeral (streams)

Flowing in response only to direct precipitation and whose channel is at all times above the water table and restricted to streams that do not flow continuously for at least 30 days.

Erosion

The group of processes whereby earth or rock material is loosened or dissolved and removed from any part of the earth's surface.

Fugitive Dust

Airborne particulate matter emitted from any source other than through a stack.

Geology

That science that relates to the earth, the rocks of which it is composed and the changes that the earth has undergone or is undergoing.

Habitat

A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover and living space.

Hydrology

The science that relates to the water of the earth.

Impact	A modification in the status of the environment brought about by the Proposed Action.
Indirect Impact	As defined within 40 CFR 1508.8, these are the effects which are caused by the action but occur later in time or are removed in distance from the action, but are still reasonably foreseeable. Synonymous with indirect effects.
Interdisciplinary team	A group of people with different training representing the physical sciences, social sciences and environmental design arts assembled to solve a problem or perform a task. The members of the team proceed to solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions.
Key Observation Point	Critical viewpoints that are usually along commonly traveled routes or at likely observation points.
Landscape	That which makes up the various attributes of land surface as a result of geologic activity and weathering, such as plateaus, mountains, plains and valleys.
Mitigation	Mitigation includes a) Avoiding the impact altogether by not taking certain action or parts of actions, b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, e) Compensating for the impact by replacing or providing substantial resources or environments.
One-hundred-year flood	A flood with a magnitude, which may occur once every one hundred years. A 1-in-100 chance of a certain area being inundated during any year.
Public Lands	Federally owned lands administered by the Bureau of Land Management.
Raptor	A bird of prey.
Right-of-Way	Public lands authorized to be used or occupied pursuant to a right-of-way grant.
Riparian	Any area of land directly influenced by permanent water that has visible vegetation or physical characteristics reflective of permanent water influence. This can include streams, springs, seeps, wet meadows, aspen stands, and similar habitats.
Scoping	Procedures by which agencies determine the extent of analysis necessary for a Proposed Action, (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data and task assignments needed).

Significant (impact)	Impact that would cause a substantial adverse change or stress to one or more environmental resources. In general, all potential high impacts were considered to be significant, but in some cases potential moderate impacts were considered significant.
Species	A group of individuals of common ancestry that closely resemble each other structurally and physiological and in nature interbreed producing fertile offspring.
Study area	The given geographical area delineated for specific research.
Threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Visual Resources	Classification of landscape based on scenic quality, sensitivity to change, and distance from the observer. Determines the amount of visible change to a characteristic landscape that is acceptable.

6.3 List of Acronyms Used in this EA:

AASHTO	American Association of State Highway and Transportation Officials
ARI	Andalex Resources, Inc.
AUM	animal unit month
BLM	Bureau of Land Management
BP	Before Present
CFR	Code of Federal Regulations
Cfs	cubic feet per second
CR	County Road
DAQ	Utah Division of Air Quality
DEQ	Utah Department of Environmental Quality
DOGM	Utah Division of Oil, Gas & Mining
DWQ	Utah Division of Water Quality
DWR	Utah Division of Wildlife Resources
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FLPMA	Federal Land Policy Management Act
fps	Feet per Second
gpm	Gallons per Minute
hp	Horsepower
HWY	Highway
IMP	Interim Management Plan (BLM)
ITARC	Interdisciplinary Team Analysis Record Checklist
KOP	Key Observation Point
KV	Kilovolt
LUP	Land use plan
M&RP	Mining and Reclamation Plan

MFP	Management Framework Plan (BLM)
MG-1	Mining and Grazing Zone
MLA	Mineral Leasing Act of 1920
NAS	National Academy of Science
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1986
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OSM	Office of Surface Mining Reclamation and Enforcement
PA	Proposed Action
PAP	Permit Application Package (UDOGM)
PFO	Price Field Office
PLS	pure live seed
PM10	particulate matter with an aerodynamic diameter of 10 microns or less
PRRA	Price River Resource Area
psf	Pounds per Square Foot
R	Range
ROW	right-of-way
SEUAG	Southeastern Utah Association of Governments
SHPO	Utah State Historic Preservation Office
SLB&M	Salt Lake Base and Meridian
SMRCA	Surface Mining Control and Reclamation Act of 1977, as amended
SPCC	Spill Prevention Control and Countermeasures Plan
SPCC Plan	Spill Prevention Control & Countermeasure Plan
SWPPP	Storm Water Pollution Prevention Plan
T	Township
T&E	threatened and endangered species
TDS	Total Dissolved Solids
TES	Threatened, Endangered and Sensitive (Species)
TSS	Total Suspended Solids
U.S.	United States
UDOGM	Utah Division of Oil, Gas and Mining
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UNPDES	Utah Non-point Discharge Effluent Source
UP&L	Utah Power and Light
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	US Geologic Survey
VRM	Visual Resource Management
WSA	Wilderness Study Area

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLIST

Project Title: Wildcat Loadout Extension

NEPA Log Number: UT-070-07-001

File/Serial Number: UTU-48027

Project Leader: Mike Robinson, Realty

PROJECT DESCRIPTION: Andalex Resources, Inc. proposes to construct, operate and maintain an extension of the existing Wildcat coal storage and loadout facility with a total acreage of 250 acres on Federal Lands administered by the BLM.

Project Location: T. 13 S., R. 09 E., Section 33: SE¼SW¼NE¼, E¼SW¼, SE¼.

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

Rationale for Determination is required for all "NIs" and "NPs." Write issue statements for "PIs"

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for significant impact analyzed in detail in the EA; or identified in a DNA as requiring further analysis

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section C of the DNA form.

Determination	Resource	Rationale for Determination*	Signature	Date
CRITICAL ELEMENTS				
NI	Air Quality	Only slight construction. will help improve	/S/ Mike Robinson	1/18/2007
NP	Areas of Critical Environmental Concern	Map Present	Mike Robinson	1/22/07
NP	Cultural Resources	inventoried no sites	Blair Miller	1/22/07
NP	Environmental Justice	None Present Map checked	/S/ Mike Robinson	1/18/2007
NP	Farmlands (Prime or Unique)	None Map checked	/S/ Jeff Brower	01/05/2007
NP	Floodplains	Map checked	/S/ Jeff Brower	01/05/2007
NP	Invasive, Non-native Species	Current inventories indicate no infestations in the project area.	Karl Drury	1/22/07
NP	Native American Religious Concerns	no known concerns	Blair Miller	1/22/07
NP	Threatened, Endangered or Candidate Plant Species	Current inventories indicate no TES species populations in the project area.	Karl Drury	1/22/07
NP	Threatened, Endangered or Candidate Animal Species	No habitat for T/E species	David L. Wall	Jan 23 2007
NP	Wastes (hazardous or solid)	No known issues	/S/ Jeff Brower	01/05/2007
NP	Water Quality (drinking/ground)	No known wells in area	/S/ Jeff Brower	01/05/2007
NP	Wetlands/Riparian Zones	No wetlands/Riparian in the area.	Karl Drury	1/22/07

Determination	Resource	Rationale for Determination*	Signature	Date
NP	Wild and Scenic Rivers	checked Map	<i>[Signature]</i>	1/23/07
NP	Wilderness	checked Map	/S/ Tom Gnojek	12/13/2006
OTHER RESOURCES / CONCERNS**				
NI	Rangeland Health Standards and Guidelines	Impacts mitigated	Ray Jensen	1/23/07
NI	Livestock Grazing	Impacts mitigated by fencing & sediment traps	Ray Jensen	1/23/07
NP	Woodland / Forestry	No woodland/forestry in project area	Karl Drury	1/22/07
NI	Vegetation including Special Status Plant Species other than FWS candidate or listed species	Potential Habitat for Crested Auklet - No known population in project area.	Karl Drury	1/22/07
NI	Fish and Wildlife Including Special Status Species other than FWS candidate or listed species e.g. Migratory birds.	Minor effects to mule deer, no raptors present	David Walker	1/22/07
NI	Soils	checked & map	/S/ Jeff Brower	01/05/2007
NI	Recreation	checked map	/S/ Tom Gnojek	12/13/2006
NI	Visual Resources	checked map	/S/ Tom Gnojek	12/13/2006
NI	Geology / Mineral Resources/Energy Production	checked plats	/S/ Don Stephens	01/05/2007
NI	Paleontology	Surface rock has PFYC of 2 low probability of fossil occurrence	<i>[Signature]</i>	1/23/07
NI	Lands / Access	checked plats	/S/ Mike Robinson	1/18/2007
NI	Fuels / Fire Management	Lack of continuous fuels will prevent major fire hazard.	Hed M. Hume	1/22/07
NI	Socio-economics	check map	/S/ Mike Robinson	1/18/2007
NP	Wild Horses and Burros	Not within an HMA.	W. Weddell	1/23/07
NP	Wilderness characteristics	checked map	/S/ Tom Gnojek	12/13/2006

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
NEPA / Environmental Coordinator	<i>[Signature]</i>	1/23/07	.
Authorized Officer	Regan L. Bunker	1/23/07	

To Do Item

☒ Notify Me



☐ Mark Private

Subject	Wildcat Loadout Extension Specialist Requests		
When	Due by Fri 12/08/2006	Start by Wed 12/06/2006	
Priority	High	Category	Major Projects, Applications
Status	State Not started		
Description			

Good Afternoon;

We are finally ready to examine the Wildcat Loadout Extension. The POD is attached and the maps will be in a following e-mail. They are also available on the following server drive: "W:\Lands\Wildcat Loadout Extension"(The POD is in the folder. The folder called "New Maps" contains the revised map of the project. The folder called "Old Maps" contains the original maps.)



POD 102306.doc

- We are revising the application to include a more standard western boundary for the ROW which originally was a metes and bounds one. It will add some 50 acres, but will make it easier to monitor.
- The Plan of Development calls for only water diversion and control structures and therefore no other facilities will be allowed unless another amendment is applied for.
- As this is a Category IV Cost Recovery Project, please keep track of the time you spend on it and turn in a log(attached below) when we are finished. It is in Excel format so you can track it on the computer instead of the old paper kind. The project code for this project will be e-mailed to you later.



Form 1323-1 Reimbursable Project Log.xls

- Here are the specialist requests for each Discipline. Please save your discipline's Request to your computer, fill it out and return it to me(preferably by e-mail). The deadline for this scoping is COB Wednesday, December 6th, 2006.



REQUEST FOR WILDLIFE REVIEW\WLE.doc



REQUEST FOR COAL MINERALS REVIEW\WLE.doc



REQUEST FOR CULTURAL RESOURCES REVIEW WLE.doc



REQUEST FOR FLUID MINERALS REVIEW WLE.doc



REQUEST FOR FUELS MANAGEMENT REVIEW WLE.doc



REQUEST FOR GRAZING REVIEW WLE.doc



REQUEST FOR HYDROLOGY-HAZMAT REVIEW WLE.doc



REQUEST FOR LEASEABLE-SALEABLE MINERALS REVIEW WLE.doc



REQUEST FOR PALEONTOLOGY REVIEW WLE.doc



REQUEST FOR RECREATION REVIEW WLE.doc



REQUEST FOR VEGETATION REVIEW WLE.doc



REQUEST FOR WILD HORSE AND BURRO REVIEW WLE.doc

Thanks

Mike Robinson
Realty Specialist
BLM Price Field Office
125 South 600 West
Price, Utah 84501
Phone: (435) 636-3630
Fax: (435) 636-3657



Jeffrey
Brower/PFO/UT/BLM/DOI
01/05/2007 01:14 PM

To Mike Robinson/PFO/UT/BLM/DOI@BLM
cc
bcc
Subject wild cat loadout EA


Looks good. There is no mention of any gullies or rills in the project area. There are two if my memory serves me right. Although they are almost always dry, except from big storms or run off, the public could look at them as needing attention.

Jeffrey Brower, Hydrologist/HazMat
BLM Price Field Office
125 South 600 West
Price, Utah 84501

(435)636-3617

"You can't make the land go against itself, not for long, the land will rebel."
Robert Jordan

Don
Stephens/PFO/UT/BLM/DOI
01/05/2007 10:57 AM

To Mike Robinson/PFO/UT/BLM/DOI@BLM
cc
bcc
Subject Re: Wildcat Loadout Extension Specialist Requests 


Mike:

There are no issues with the Wildcat loadout expansion as far as fluid minerals is concerned.

Don Stephens
BLM
Price, Field Office



Tom
Gnojek/PFO/UT/BLM/DOI
12/13/2006 03:04 PM

To Mike Robinson/PFO/UT/BLM/DOI@BLM
cc Wayne Ludington/PFO/UT/BLM/DOI@BLM
bcc
Subject Re: Wildcat Loadout Extension Specialist Requests 

I have completed the Request for Review (on the W: dir) and see no particular problems.



REQUEST FOR RECREATION REVIEW\WLE.doc

Tom Gnojek, Outdoor Recreation Planner/Wilderness Specialist
Bureau of Land Management, Price Field Office
Price UT 84501 (435)636-3631

REQUEST FOR RECREATION/WILDERNESS STUDY AREA/VRM REVIEW

To: Recreation Planner

Date: December 13, 2006

FROM: Mike Robinson, Realty Specialist

Reference No. (lease, case, project, EAR, etc.): UTU-48027

Company Name: Andalex Resources, Inc.

Project Name: Wildcat Loadout Extension

Location: T. 13 S., R. 09 E., Section 33: SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$.

USGS Quadrangle: Standardville

County: Carbon

Description of Proposed Action: an extension of the existing Wildcat coal storage and loadout facility

Oil and Gas EA/EIS Area: None

DATE RESPONSE NEEDED: December 6, 2006

SF-299, PLAN OF DEVELOPMENT AND LOCATION MAP ATTACHED

RESPONSE

Recreation - Since the use of this site is well established impacts to recreation shouldn't be affected even by the site's expansion.

Wilderness/WSA - none present

VRM - The area is within Class III currently and in the proposed RMP. The level of change to the landscape may be moderate in its impact.

_____ Monitoring hours **estimated**
_____ Processing fee hours **actual**

Tom Gnojek _____
Recreation Planner,

_____ December 13, 2006 _____
Date

**Wildcat Loadout Expansion Project
BLM Pre-Application Meeting
& Subsequent Onsite
September 27, 2006, 1:00 pm**

Name	Initials	Company/Agency
Dave Shaver	DS	Andalex Resources
Blaine Miller	BM	Bureau of Land Management
Jeff Brower	JB	Bureau of Land Management
Mike Robinson	MR	Bureau of Land Management
Sue Berger	SB	Bureau of Land Management
Mel Coonrod	MC	Environmental Industrial Services
Katie Nash	KN	Environmental Industrial Services

- DS -** Introduction to Wildcat Coal Loadout Expansion Project.
- The loadout site is permitted under UDOGM.
 - At this time there are 4 sediment ponds located within the current permit area.
 - Andalex would like to expand their ROW to include the entire southeast ¼ of Section 33.
 - Approximately 80-100 acres is already under lease by Andalex.
 - Existing drainages would not be changed. Andalex would build drainage ditches that run into a central sediment pond.

MR - Would do an ID Team Checklist or a Specialist Request.

DS - No cultural has been done on this site yet. Andalex will contact SencoPhenix for a class III Archaeological study.

MC - Can EIS complete a habitat delineation to determine whether a TES survey is warranted. The current field season is over and we are not sure of Andalex's timeline.

DS - Time line is as soon as possible.

JB - Hydrological questions. Are there culverts currently placed in the areas where the road crosses the drainages.

DS - Andalex will try to stay north and west of the main oil and gas access road, but for EA purposes, assume the entire area would be disturbed.

MC - Issues as of now... Wildlife, Vegetation, TES, Raptors, Prairie dogs...

BM - Cultural Issues... 2 sites are located near the currently permitted area.

DS - Would need to update the Reclamation Plan for UDOGM.

MC – EIS would just tier off of the MRP for EA purposes.

SB - BLM will need to send OSM a courtesy copy of the EA.

MR - Need to schedule an onsite and do scoping.

Reasonable Foreseeable Future Actions – Address the expansion of the coal piles, possibly expanding the SE piles to the East for expansion of facility capacity and new truck dump location. Would be immediately next to the existing coal pile.

Cumulative Impacts – Only include those cumulative impacts associated with oil and gas lease development.

Needed Prior to Scoping

Good map showing the proposed project including proposed ditches, ponds, etc.
A thorough Plan Of Development.

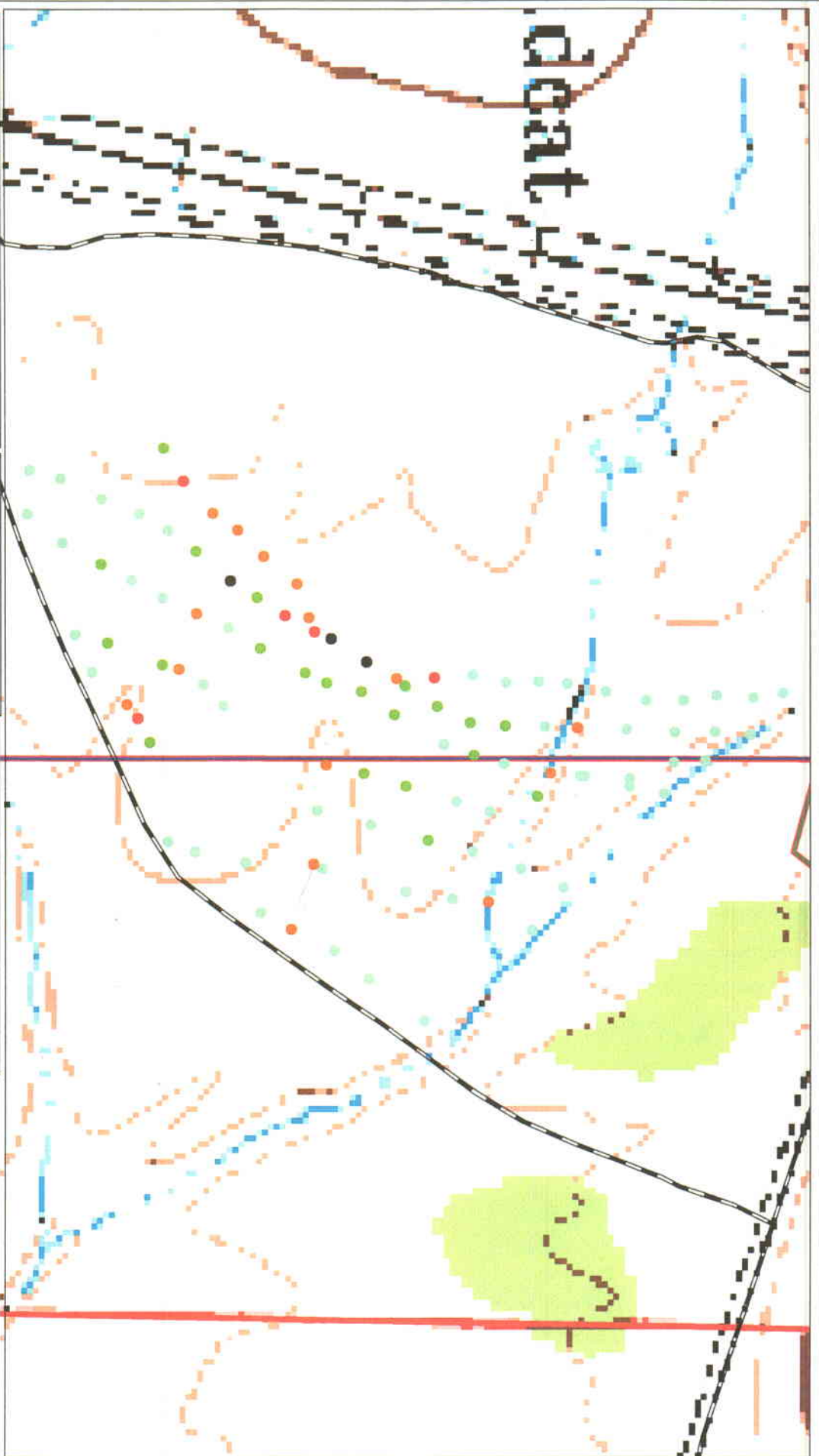
POD will state that there will be no fencing around the new permit area.

Needs to be Completed

Class III Cultural Survey
Habitat delineation or TES survey (dependant on Karl Ivory)
Gather raptor information

APPENDIX U

COAL FINES ACCUMULATION MAP
E.I.S. ENVIRONMENTAL CONSULTANTS



LEGEND

█ ROW Requested (98 Acres)

█ U-48027 (78.5 Acres)

█ U-52065 (12.5 Acres)



Road

Section 33
Township 13 South,
Range 9 East,
Salt Lake Base & Meridian.

COAL DEPTH IN INCHES

0 - 0.75

0.75 - 2

2 - 4.5

4.5 - 6.5

6.5 - 12

Created For

ANDALEX RESOURCES, INC.

**Environmental
Industrial
Services**

Environmental & Engineering Consulting

31 North Main Street
Helper, Utah 84526
(435) 472-3814
FAX: (435) 472-8780
kvnash@precisecorp.net



Created By: Katie Nash
Date: October 11, 2006

Scale 1" = 1,000'

DISCLAIMER:
EIS is not responsible for any errors or omissions.
All topographic maps were downloaded from:
<http://www.waterrights.utah.gov>
EIS 2006

PLATE

1

APPENDIX V

PART A: OWNERSHIP AND CONTROL

PART B: OTHER SMCRA PERMITS

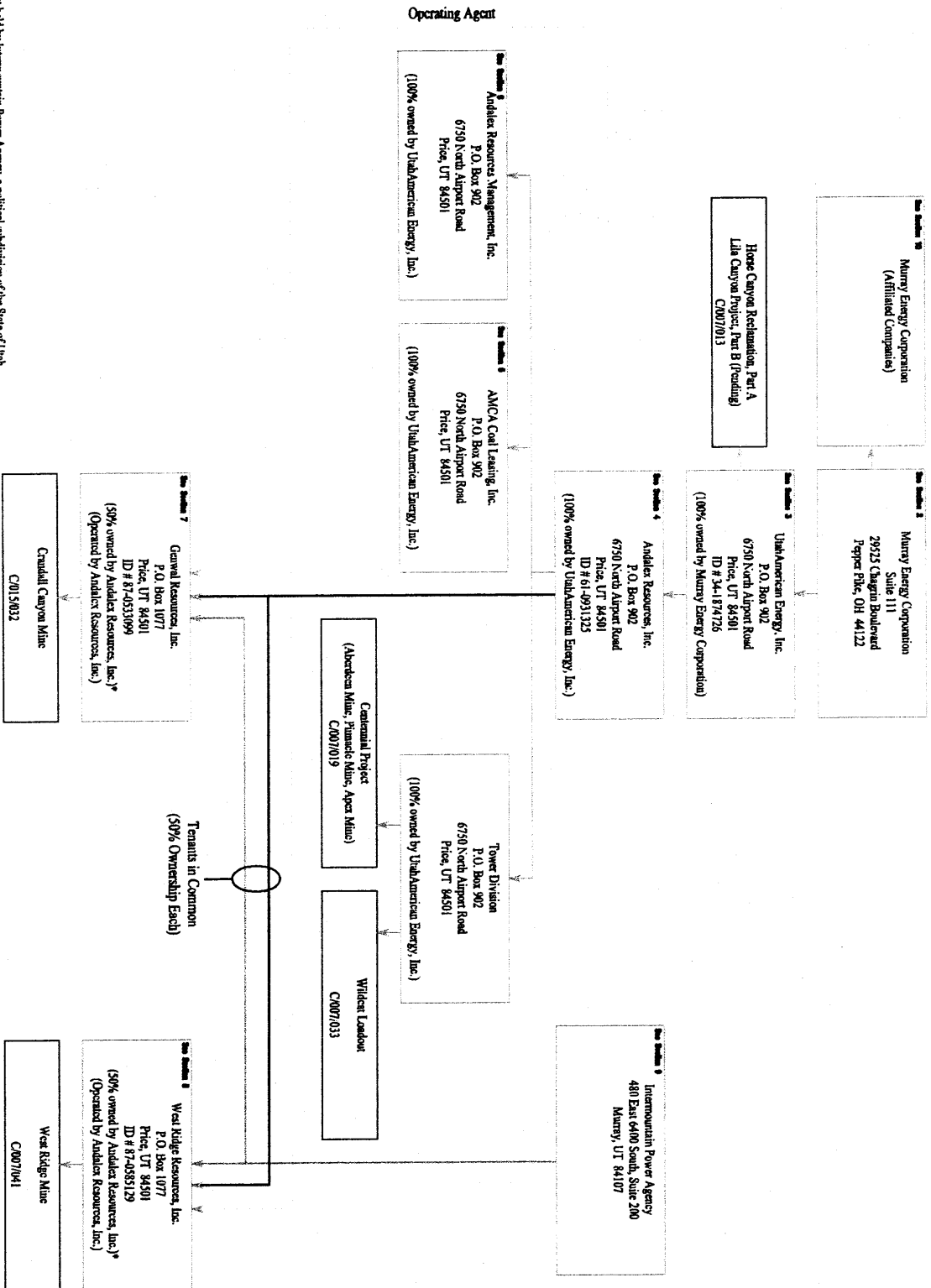
PART A: OWNERSHIP AND CONTROL

APPENDIX 1-1

OWNERSHIP AND CONTROL

OWNERSHIP AND CONTROL

Section 1



* 50% undivided interest held by Intermountain Power Agency, a political subdivision of the State of Utah.

Section 2

MURRAY ENERGY CORPORATION
Suite 111
29525 Chagrin Boulevard
Pepper Pike, OH 44122

Appointment of Officers

Robert E. Murray	Chairman, President & Chief Executive Officer	Begin 02/23/01 02/23/01
John R. Forrelli	Vice President	12/18/03
Robert D. Moore	Vice President	12/17/04
P. Bruce Hill	Vice President - Human Resources	12/18/03
Michael D. Loiacono	Treasurer	02/23/01
	Chief Financial Officer	12/20/05
Michael O. McKown	Secretary	02/23/01

Incorporation Information:

State of Incorporation	Ohio; Charter No. 1211519
Date of Incorporation	February 23, 2001
ID#	34-1956752

Shareholder:

Murray Energy Holdings Co. (100%)

Directors:

Robert E. Murray	02/23/01
Michael D. Loiacono	12/20/05
Henry W. Fayne	01/28/05
Richard L. Lawson	01/28/05
Andrew D. Weissman	10/23/03

Section 3

UTAHAMERICAN ENERGY, INC.

P.O. Box 902

6750 North Airport Road

Price, UT 84501

Appointment of Officers:

		Begin	End
P. Bruce Hill	Chief Executive Officer	08/18/06	
P. Bruce Hill	President	12/16/06	
Douglas H. Smith	President	08/18/06	12/16/06
Clyde I. Borrell	President	07/31/98	05/19/06
Robert D. Moore	Treasurer	08/18/06	
Michael O. McKown	Secretary	08/18/06	
Marsha Baker Kocinski	Secretary	07/31/98	06/25/02
Barbara Boyce	Secretary	07/31/98	11/01/99

Directors:

Robert E. Murray	07/31/98
P. Bruce Hill	08/18/06

Section 4

ANDALEX RESOURCES, INC.
P.O. Box 902
6750 North Airport Road
Price, UT 84501

Appointment of Officers:

		Begin	End
P. Bruce Hill	Chief Executive Officer	08/18/06	
P. Bruce Hill	President	12/16/06	
Douglas H. Smith	President	08/18/06	12/16/06
Robert D. Moore	Treasurer	08/18/06	
Michael O. McKown	Secretary	08/18/06	

Former Officers

Peter B. Green	Director	01/05/98	08/18/06
Peter B. Green	CB	05/11/90	08/18/06
Peter B. Green	CEO	05/11/90	08/18/06
Ronald C. Beedie	Director	01/05/88	08/18/06
John Bradshaw	Secretary	02/05/90	08/18/06
John Bradshaw	Vice-President	02/05/90	08/18/06
Douglas H. Smith	Director	03/07/94	08/18/06
Douglas H. Smith	President	03/07/94	08/18/06
Samuel C. Quigley	Vice-President	02/24/95	08/18/06
Andalex Hungary Ltd.	Shareholder	12/28/20	08/18/06
Alexander Harold Samuel Green	Director	01/11/02	08/18/06

Directors:

Robert E. Murray	08/18/06
P. Bruce Hill	08/18/06

MSHA Numbers

Apex Mine	42-01750
Pinnacle Mine	42-01474
Aberdeen Mine	42-02028
Wildcat Loadout	42-01864

Section 5

AMCA COAL LEASING, INC.
P.O. Box 902
6750 North Airport Road
Price, UT 84501

Appointment of Officers:

		Begin	End
P. Bruce Hill	Chief Executive Officer	08/18/06	
P. Bruce Hill	President	12/16/06	
Douglas H. Smith	President	08/18/06	12/16/06
Robert D. Moore	Treasurer	08/18/06	
Michael O. McKown	Secretary	08/18/06	

Directors:

Robert E. Murray	08/18/06
P. Bruce Hill	08/18/06

Section 6

ANDALEX RESOURCES MANAGEMENT, INC.
P.O. Box 902
6750 North Airport Road
Price, UT 84501

Appointment of Officers:

		Begin	End
P. Bruce Hill	Chief Executive Officer	08/18/06	
P. Bruce Hill	President	12/16/06	
Douglas H. Smith	President	08/18/06	12/16/06
Robert D. Moore	Treasurer	08/18/06	
Michael O. McKown	Secretary	08/18/06	

Directors:

Robert E. Murray	08/18/06
P. Bruce Hill	08/18/06

Shareholders:

	Own	
UtahAmerican Energy, Inc.	100%	08/18/06

Section 7

GENWAL RESOURCES, INC.

P.O. Box 1077

Price, UT 84501

Appointment of Officers:

		Begin	End
P. Bruce Hill	Chief Executive Officer	08/18/06	
P. Bruce Hill	President	12/06/06	
Douglas H. Smith	President	08/18/06	12/16/06
Robert D. Moore	Treasurer	08/18/06	
Michael O. McKown	Secretary	08/18/06	

Directors:

Robert E. Murray	08/18/06
P. Bruce Hill	08/18/06

MSHA Numbers

Crandall Canyon Mine	42-01715
----------------------	----------

Section 8

WEST RIDGE RESOURCES, INC.

P.O. Box 1077

Price, UT 84501

Appointment of Officers:

		Begin	End
P. Bruce Hill	Chief Executive Officer	08/18/06	
P. Bruce Hill	President	12/16/06	
Douglas H. Smith	President	08/18/06	12/16/06
Robert D. Moore	Treasurer	08/18/06	
Michael O. McKown	Secretary	08/18/06	

Directors:

Robert E. Murray	08/18/06
P. Bruce Hill	08/18/06

MSHA Number

West Ridge Mine 42-02233

Section 9

INTERMOUNTAIN POWER AGENCY

(Tenant in Common, 50% undivided interest; West Ridge Mine Permit C/007/046; Crandall Canyon Mine Permit C/015/032)

480 East 6400 South

Suite 200

Murray, UT 84107

Appointment of Officers

Ray Farrell	Chairman	12/1998
R. Leon Bowler	Vice-Chairman	12/1984
Ted L. Olson	Secretary	01/2002
Clifford C. Michaelis	Treasurer	01/1990

Directors

R. Leon Bowler	06/1977
Ray Farrell	11/1978
Clifford C. Michaelis	01/1988
Ted L. Olson	01/1990
Russell F. Fjeldsted	01/1992
Walter Meacham	01/1999
Gary O. Merrill	01/2002

Name and address of IPA's general manager:

Reed T. Searle
Intermountain Power Agency
480 East 6400 South, Suite 200
Murray, Utah 84107
Telephone (801)262-8807
Assumed position September, 1989

Resident Agent for IPA:

Mark Buchi
Holme, Roberts, and Owen
299 South Main, Suite 1800
Salt Lake City, Utah 84111
Assumed position January, 1988

IPA Designated representative to the Crandall Canyon Project and West Ridge Project Management Boards:

Eric J. Tharp
Operating Agent
Los Angeles Department of Water & Power
111 North Hope Street, Room 1263
Los Angeles, California 90012-2694
Telephone (213)367-0286

Principle Shareholders of IPA:

IPA has no shareholders. IPA is a political subdivision of the State of Utah created under the Interlocal Cooperation Act, Title II, Chapter 13, Utah Code Ann. 1953, as amended, and as such, has not issued stock.

Section 10

MURRAY ENERGY AFFILIATE COMPANIES

AMCOAL HOLDINGS, INC.

10/10/05-blr

Principal Office:

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

101 Prosperous Place
Suite 125
Lexington, Kentucky 40509

Officers:

Robert E. Murray	President	5/23/03
P. Bruce Hill	Vice President – Human Resources	10/01/98
Robert D. Moore	Treasurer	10/01/98
Michael O. McKown	Secretary	3/1/05
Jeffrey L. Cash	Assistant Treasurer	11/01/99

Incorporation Information:

State of Incorporation: Ohio;
Charter No. 1007981

Date of Incorporation: June 12, 1998

ID #34-1867389

Shareholders:

Murray Energy Corporation

Directors:

Robert E. Murray

Revised 2/14/05

THE AMERICAN COAL COMPANY

Principal Office:
29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

P. O. Box 727
Harrisburg, Illinois 62946

Officers:

Robert E. Murray	Acting President	11/02/02
John R. Forrelli	Vice President	9/07/04
Michael O. McKown	Vice President, General Counsel and Secretary	3/15/99 3/1/05
P. Bruce Hill	Vice President – Human Resources	10/01/98
Robert D. Moore	Treasurer	10/01/98
Jeffrey L. Cash	Assistant Treasurer and Assistant Secretary	11/01/99 6/01/01

Incorporation Information:

State of Incorporation	Delaware; Charter No. 2881631
Date of Incorporation	June 2, 1998
ID #73-1543124	

Shareholders: AmCoal Holdings, Inc.

Directors: Robert E. Murray

Revised: 2/14/05

AMERICAN COAL RESOURCES, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

		Begin	End
Robert E. Murray	President and Chief Executive Officer	4/15/93	
		4/15/93	
James R. Turner, Jr.	Treasurer and Assistant Secretary	3/1/05	
Michael D. Loiacono.	Treasurer and Assistant Secretary	4/15/93	3/1/05
Michael O. McKown	Secretary	3/1/05	

Incorporation
Information:

State of Incorporation Ohio;
Charter No. 743293

Date of Incorporation February 23, 1989

ID #34-1615627

Shareholders:

Robert E. Murray
Donald P. Krahel and
Virginia B. Krahel (joint
tenants with right of
survivorship)

Directors:

Robert E. Murray 1/14/91
Brenda L. Murray

Revised 2/14/05

THE AMERICAN COAL SALES COMPANY

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

Robert E. Murray	Chief Executive Officer	11/11/88
B. J. Cornelius	President	9/08/95
Edwin D. Lane	Vice President	11/01/99
William E. Hollars	Vice President	3/1/05
Michael O. McKown	Secretary	3/1/05
James R. Turner, Jr.	Treasurer and Assistant Secretary	3/1/05
Duane A. Smith	Assistant Treasurer and Assistant Secretary	6/25/01 6/25/01

Incorporation Information:

State of Incorporation	Ohio; Charter No. 727836
Date of Incorporation	June 29, 1988
ID #34-1603699	

Shareholder:

Coal Resources, Inc.

Directors:

Robert E. Murray	9/08/95
------------------	---------

Revised 2/14/05

AMERICAN COMPLIANCE COAL, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

		Begin	End
Stanley T. Piasecki	President	3/1/05	
Charles E. Shestak	Vice President	03/10/03	
Michael O. McKown	Secretary	3/1/05	
Robert D. Moore	Treasurer and Assistant Secretary	6/25/01 6/25/01	
Elmer A. Mottillo	Assistant Treasurer	8/22/03	

Former Officers:

Clyde I. Borrell	President	6/02/97	3/1/05
William W. Taft	Secretary	5/24/94	3/1/05

Incorporation Information:

State of Incorporation Colorado;
Charter No. 19941059260

Date of Incorporation May 24, 1994

ID #34-1797161

Shareholder:

Murray Energy Corporation 6/1/01
(100%)

Director:

Robert E. Murray

Revised
3/6/07

AMERICAN ENERGY CORPORATION

43521 Mayhugh Hill Road
Township Highway 88
Beallsville, Ohio 43716

Officers:

		Begin	End
Robert E. Murray	President	12/15/04	
Robert D. Moore	President	6/25/01	12/15/04
Michael O. McKown	Secretary	11/01/99	
James R. Turner, Jr.	Treasurer	3/1/05	
Robert D. Moore	Treasurer	6/25/01	12/15/04
Robert L. Putsock	Assistant Treasurer	1/27/04	

Incorporation Information:

State of Incorporation	Ohio; Charter No. 00842695
Date of Incorporation ID #31-1550443	April 12, 1993

Shareholder:

Murray Energy Corporation
(100%_

Director:

Robert E. Murray	12/15/04
------------------	----------

Revised
3/6/07

ANCHOR LONGWALL AND REBUILD, INC.

One Industrial Park Drive
Wheeling, West Virginia 26003

Officers:

P. Bruce Hill	President and Assistant Secretary	2/16/99 2/16/99
Michael O. McKown	Secretary	11/01/99
James R. Turner, Jr.	Treasurer	9/16/05
Duane A. Smith	Assistant Secretary	11/01/99

Incorporation Information:

State of Incorporation	West Virginia; Charter No. 00961100093212818
------------------------	---

Date of Incorporation	April 18, 1996
-----------------------	----------------

ID #55-0749933

Shareholder:

I.D. # 34-1586390
Address: 29325 Chagrin
Boulevard
Suite 300
Pepper Pike, OH 44122

Coal Resources, Inc.

Director:

Charles E. Shestak	11/01/99
P. Keith McGilton	11/01/99

Revised
3/6/07

AVONMORE RAIL LOADING, INC.

125 Old Farm Drive,
Pittsburgh, PA 15239

Officers:

P. Bruce Hill	President	6/25/01
Robert D. Moore	Treasurer	6/25/01
Michael O. McKown	Secretary	3/1/05
Robert L. Putsock	Assistant Treasurer	1/02/03
Elmer A. Mottillo	Assistant Secretary	1/02/03

Incorporation Information:

State of Incorporation	Delaware; Charter No. 0798860
Date of Incorporation Qualified	February 19, 1974 May 6, 1974 Pennsylvania; PA Entity #000302999

ID #25-1253970

Shareholder: Mill Creek Mining Company

Director: Charles E. Shestak

Revised: 2/14/05

BELMONT COAL, INC.

P. O. Box 146
Powhatan, Ohio 43942

Officers:

		Begin	End
Robert D. Moore	President	6/25/01	
Maynard St. John	Vice-President	1/02/02	6/26/02
James R. Turner, Jr.	Secretary/Treasurer	9/16/05	
Kristi D. Brown	Secretary/Treasurer	11/08/01	9/16/05

Incorporation Information:

State of Incorporation Ohio;
Charter No. 00842697

Date of Incorporation April 12, 1993

ID #31-1536602

Shareholder:

Murray Energy Corporation (100%)	6/1/01	
Robert E. Murray	4/19/93	6/1/01

Director:

Duane A. Smith	4/12/93
----------------	---------

Revised
3/6/07

CANTERBURY COAL COMPANY

125 Old Farm Drive
Pittsburgh, PA 15239

Officers:

P. Bruce Hill	President and General Manager	6/25/01
Robert D. Moore	Secretary and Treasurer	6/25/01 6/25/01
Robert L. Putsock	Assistant Treasurer	1/02/03
Elmer A. Mottillo	Assistant Secretary	1/02/03

Incorporation Information:

State of Incorporation Pennsylvania;
PA Entity #000055242

Date of Incorporation July 26, 1963

ID #25-1127473

Shareholder: Mill Creek Mining Company
(100%)

Director: Charles E. Shestak

Revised
3/6/07

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

COAL RESOURCES, INC.

Officers:

Robert E. Murray	Chairman, President and Chief Executive Officer	3/1/05
Michael D. Loiacono	Treasurer	1/28/05
Scott A. Boyle	Chief Financial Officer	10/17/05
P. Bruce Hill	Secretary	3/1/05
Robert L. Putsock	Assistant Secretary and Assistant Treasurer	6/25/01 6/25/01

Incorporation Information:

State of Incorporation	Ohio; Charter No. 717546
Date of Incorporation	January 29, 1988
ID #34-1586390	

Shareholder:

Coal Resources Holdings Co.

Directors:

Robert E. Murray	
Henry W. Fayne	
Andrew Weissman	
Richard L. Lawson	
Michael D. Loiacono	12/20/05

Revised
3/6/07

COAL RESOURCES HOLDINGS CO.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

Robert E. Murray	Chairman, President and Chief Executive Officer	3/1/05
Michael D. Loiacono	Treasurer & Chief Financial Officer	1/28/05
P. Bruce Hill	Secretary	3/1/05
Robert L. Putsock	Assistant Secretary and Assistant Treasurer	6/30/03

Incorporation Information:

State of Incorporation	Delaware Charter No.
Date of Incorporation	June 27, 2003
ID #	20-0100479

Shareholders:

Robert Eugene Murray
Robert Edward Murray
Jonathan Robert Murray
Ryan Michael Murray
Fifth Third Bank of Northeast
Ohio, Trustee

Director:

Robert E. Murray

Revised
3/6/07

CONSOLIDATED LAND COMPANY

29325 Chagrin Boulevard, Suite 300
Pepper Pike, Ohio 44122

Officers:

Robert D. Moore	President	8/11/04
Robert D. Moore	Treasurer and Assistant Secretary	6/25/01 6/25/01
Michael O. McKown	Secretary	3/1/05
Elmer A. Mottillo	Assistant Secretary	8/22/03

Incorporation Information:

State of Incorporation	Ohio; Charter No. 00842696
Date of Incorporation	April 12, 1993
ID #34-1769562	

<u>Shareholder:</u>	Murray Energy Corporation (100%)	6/1/01
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<u>Director:</u>	Robert D. Moore	8/11/04
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Revised
3/6/07

ENERGY RESOURCES, INC.

P. O. Box 259
R. D.#2, Fermantown Road
Brockway, PA 15824

Officers:

Stanley T. Piasecki	President and Chief Executive Officer	8/11/04
Elmer A. Mottillo	Treasurer	8/22/03
Michael O. McKown	Secretary	3/1/05
Charles E. Shestak	Assistant Secretary	4/30/93

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #762734
Date of Incorporation	September 14, 1982
ID #31-1044044	

Shareholder:

Mill Creek Mining Company

Director:

Stanley T. Piasecki	8/11/04
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THE HOCKING VALLEY RESOURCES COMPANY

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

P. Bruce Hill	President	3/1/05
Michael D. Loiacono	Secretary and Treasurer	4/05/93

Incorporation Information:

State of Incorporation	Ohio; Charter No. 755531
Date of Incorporation	August 25, 1989
ID #34-1635301	

Shareholder:

Ohio Valley Resources, Inc.

Director:

Robert E. Murray	4/05/93
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Revised
3/6/07

KENAMERICAN RESOURCES, INC.

101 Prosperous Place
Suite 125
Lexington, Kentucky 40509

Officers:

Robert N. Sandidge	President	12/16/06
B. J. Cornellius	Senior Vice-President--Sales	11/1/05
James R. Turner, Jr.	Treasurer	3/1/05

Robert D. Moore	Assistant Treasurer	3/1/05
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Michael O. McKown	Secretary	2/13/06
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Incorporation Information:

State of Incorporation	Kentucky; Charter No. 0331655
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Date of Incorporation	June 9, 1994
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ID #61-1264385

<u>Shareholder:</u>	Mill Creek Mining Company
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<u>Director:</u>	Robert E. Murray	6/1/05
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Revised
3/6/07

MAPLE CREEK MINING, INC.

Principal Office:

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

981 Route 917
Bentleyville, Pennsylvania 15314

Officers:

Paul B. Piccolini	President	4/28/06
Ronnie D. Dietz	Vice President and Treasurer	3/1/05
Michael B. Gardner	Secretary	3/1/05
Roberta K. Heil	Assistant Secretary	11/01/99

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #2607113
Date of Incorporation	November 9, 1994
ID #25-1755305	

<u>Shareholder:</u>	Sunburst Resources, Inc.	1/11/95
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<u>Director:</u>	Robert E. Murray
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MILL CREEK MINING COMPANY

P. O. Box 259
R. D. #2, Fermantown Road
Brockway, PA 15824

Officers:

Charles E. Shestak	President	8/18/98
James R. Turner, Jr.	Treasurer	3/1/05
Robert D. Moore	Assistant Treasurer	3/1/05
Michael O. McKown	Secretary	3/1/05
Robert L. Putsock	Assistant Secretary and Assistant Treasurer	6/25/01 6/25/01

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #0007447787
Date of Incorporation	December 1, 1981
Certificate of Amendment	July 7, 1988; #8854525
ID #31-1040986	

Shareholder:

Coal Resources, Inc.

Director:

Robert E. Murray 5/14/04

Revised
3/6/07

MONVALLEY TRANSPORTATION CENTER, INC.

P. O. Box 135
1060 Ohio Avenue
Glassport, Pennsylvania 15045

Officers:

Paul B. Piccolini	President	4/28/06
James R. Turner, Jr.	Secretary and Treasurer	3/1/05

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #856918
Date of Incorporation	February 15, 1985
ID #25-1490495	

Shareholders:

Pennsylvania Transloading, Inc.

Directors:

Robert E. Murray and Michael D. Loiacono	11/01/99
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MURRAY ENERGY CORPORATION

29325 Chagrin Boulevard, Suite 300
Pepper Pike, Ohio 44122

Officers:

Robert E. Murray	Chairman, President, & Chief Executive Officer	2/23/01 2/23/01
John R. Forrelli	Vice President	12/18/03
Robert D. Moore	Vice President	12/17/04
P. Bruce Hill	Vice President-Human Resources	12/18/03
Michael D. Loiacono	Treasurer Chief Financial Officer	2/23/01 12/20/05
Michael O. McKown	Secretary	2/23/01

Incorporation Information:

State of Incorporation	Ohio; Charter No. 1211519
Date of Incorporation	February 23, 2001
ID #34-1956752	

Shareholder:

Murray Energy Holdings Co.

Directors:

Robert E. Murray	
Michael D. Loiacono	1/28/05
Henry W. Fayne	1/28/05
Richard L. Lawson	1/28/05
Andrew D. Weissman	10/23/03

Revised 3/6/07

MURRAY ENERGY HOLDINGS CO.

29325 Chagrin Boulevard, Suite 300
Pepper Pike, Ohio 44122

Officers:

Robert E. Murray	Chairman, President, & Chief Executive Officer	6/30/03
Michael D. Loiacono	Chief Financial Officer and Treasurer	1/10/05 6/30/03
Michael O. McKown	Secretary	6/30/03

Incorporation Information:

State of Incorporation	Delaware; Charter No.
Date of Incorporation	June 27, 2003
ID #	20-0100463

Shareholders:

Robert Eugene Murray
Robert Edward Murray
Jonathan Robert Murray
Ryan Michael Murray
Fifth Third Bank of
Northeast Ohio, Trustee

Directors:

Robert E. Murray	6/30/03
Michael D. Loiacono	6/30/03
Michael O. McKown	6/30/03

Revised
3/6/07

OHIOAMERICAN ENERGY INCORPORATED

29325 Chagrin Boulevard, Suite 300
Pepper Pike, Ohio 44122

Officers:

D. Michael Jamison	President	5/1/05
Michael O. McKown	Secretary	5/1/05
Robert D. Moore	Treasurer	5/1/05
Elmer A. Mottillo	Assistant Treasurer	6/30/06

Incorporation Information:

State of Incorporation	Ohio
Date of Incorporation	February 1, 2005
ID # 20-3044610	Ohio Charter No. 1518533

<u>Director:</u>	Robert E. Murray	5/1/05
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<u>Shareholder:</u>	Murray Energy Corporation	5/1/05
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Revised
3/6/07

THE OHIO VALLEY COAL COMPANY

Principal Office:
56854 Pleasant Ridge Road
Alledonia, Ohio 43901

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

Vacant	President	11/4/05
Paul B. Piccolini	Vice-President	1/1/07
Ronnie D. Dietz	Treasurer,	3/1/05
	Assistant Secretary and	
	Corporate Comptroller	
Michael B. Gardner	Secretary	3/1/05
Roberta K. Heil	Assistant Secretary	11/01/99
Bonnie M. Froehlich	Assistant Secretary and	6/25/01
	Assistant Treasurer	6/25/01

Incorporation Information:

State of Incorporation Ohio;
Charter No. 384971

Date of Incorporation June 6, 1969

Certificate of Amendment October 4, 1988;
#201274

ID #34-1041310

Shareholder: Ohio Valley Resources, Inc.

Director: Robert E. Murray

Revised
3/7/07

OHIO VALLEY RESOURCES, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

		Begin	End
Paul B. Piccolini	President	4/28/06	
John Forrelli	President	11/1/99	4/28/06
Ronnie D. Dietz	Treasurer, Assistant Secretary and Corporate Comptroller	3/1/05	
Michael D. Loiacono	Treasurer, Assistant Secretary and Corporate Comptroller	3/10/95	4/28/06
Michael B. Gardner	Secretary	3/1/05	
Stephen Ellis	Secretary	3/10/95	3/1/05

Incorporation Information:

State of Incorporation Ohio;
Charter No. 721514

Date of Incorporation March 29, 1988

ID #34-1586391

Shareholders:

Murray Energy Corporation	6/1/01	
(100%)		
Robert E. Murray	3/10/95	6/1/01

Director:

Robert E. Murray

Revised
3/6/07

THE OHIO VALLEY TRANSLOADING COMPANY

56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Officers:

Vacant	President	11/4/05
Paul B. Piccolini	Vice-President	1/1/07
Ronnie D. Dietz	Treasurer, Assistant Secretary and Corporate Comptroller	3/1/05
Michael B. Gardner	Secretary	3/1/05
Roberta K. Heil	Assistant Secretary	9/01/00

Incorporation Information:

State of Incorporation	Ohio; Charter No. 727835
Date of Incorporation	June 29, 1988
ID #34-1611209	

Shareholder:

Ohio Valley Resources, Inc.

Director:

Robert E. Murray	4/06/93
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Revised
3/6/07

THE OKLAHOMA COAL COMPANY

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

		Begin	End
Paul B. Piccolini	President	4/28/06	
Gregory C. Smith	President	11/1/99	4/28/06
Michael O. McKown	Secretary	3/1/05	
Gregory A. Gorospe	Secretary	9/15/94	11/1/99
James R. Turner, Jr.	Treasurer and Assistant Secretary	3/1/05	
Kathleen Bednarek	Treasurer	6/20/00	6/26/00
Robert L. Putsock	Assistant Secretary	1/10/03	
Kathleen Bednarek	Assistant Secretary	9/3/96	6/26/00

Incorporation Information:

State of Incorporation Oklahoma;
Charter No. DB00477836

Date of Incorporation April 17, 1989

Licensed in Ohio February 27, 1991;
FL 790739

ID #34-1673480

Shareholder: The American Coal Sales Company

Director: Robert E. Murray

Revised
3/6/07

ONEIDA COAL COMPANY, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

		Begin	End
Robert D. Moore	President and	6/25/01	
	Treasurer	11/01/99	
Robert L. Putsock	Assistant Secretary	6/25/01	
Michael O. McKown	Secretary	3/1/05	

Former Officers:

John Blaine Earles	Vice-President	2/28/92	7/2/93
Tivis Arnold Graybeal	Secretary	2/28/92	4/28/94
Anthony Carl Laplaca	Secretary	4/28/94	11/1/99
Joseph R. Bourgo	Vice-President	9/1/92	10/20/00
Joseph R. Bourgo	Treasurer	4/28/94	10/20/00
Norma Jean Mccourt	Assistant Secretary	4/28/94	11/1/99

Incorporation Information:

State of Incorporation West Virginia;
Charter No.
00000020004097TAX

Date of Incorporation August 29, 1983

ID #62-1011712

Shareholder: West Virginia Resources, Inc. 2/28/92
(100%)

Director: Robert E. Murray

Revised 3/6/07

125 Old Farm Drive
Pittsburgh, PA 15239

PENNAMERICAN COAL, INC.

Officers:

P. Bruce Hill	President	6/25/01
Robert D. Moore	Treasurer and Secretary	6/25/01 6/25/01
Robert L. Putsock	Assistant Secretary	6/25/01

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #2545905
Date of Incorporation	September 13, 1993
ID #25-1722115	

<u>Shareholder:</u>	Mill Creek Mining Co.	11/08/93
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<u>Director:</u>	Robert E. Murray
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Revised 2/14/05

125 Old Farm Drive
Pittsburgh, PA 15239

PENNAMERICAN COAL LP

Partners:

Pinski Corp.	Managing Partner	8/19/96
PennAmerican Coal, Inc.	Limited Partner	7/8/98

EIN# 25-1800809
Partnership Effective 7/8/98

Revised
3/6/07

PENNSYLVANIA TRANSLOADING, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

Paul B.. Piccolini	President	4/28/06
James R. Turner, Jr.	Treasurer	3/1/05
Michael O. McKown	Secretary	3/1/05

Incorporation Information:

State of Incorporation	Ohio; Charter No. 736747
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Date of Incorporation	November 18, 1988
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Qualified:	Pennsylvania; December 28, 1988
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Certificate of Authority	No. 8898868
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ID #34-1603748

<u>Shareholder:</u>	Sunburst Resources, Inc.	4/01/96
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<u>Director:</u>	Robert E. Murray
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Revised
3/6/07

PINSKI CORP.

125 Old Farm Drive
Pittsburgh, PA 15239

Officers:

P. Bruce Hill	President and General Manager	9/05/00
Robert D. Moore	Treasurer and Secretary	6/25/01 6/25/01
Robert L. Putsock	Assistant Treasurer and Assistant Secretary	6/25/01 6/25/01

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #002710766
Date of Incorporation	August 19, 1996
ID #25-1800870	

Shareholder: PennAmerican Coal, Inc.

Director: Charles E. Shestak

Revised 2/14/05

SPRING CHURCH COAL COMPANY

125 Old Farm Drive
Pittsburgh, PA 15239

Officers:

P. Bruce Hill	President	6/25/01
Robert D. Moore	Secretary and Treasurer	6/25/01 6/25/01
Robert L. Putsock	Assistant Treasurer	1/02/03
Elmer A. Mottillo	Assistant Secretary	1/02/03

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #000696663
Date of Incorporation	November 2, 1979
ID #25-1372128	

Shareholder:

Mill Creek Mining Company

Director:

Charles E. Shestak

Revised: 2/14/05

SUNBURST RESOURCES, INC.

586 National Road
Wheeling, West Virginia 26003

Officers:

Paul B. Piccolini	President	4/28/06
Ronnie D. Dietz	Treasurer	3/1/05
Michael B. Gardner	Secretary	3/1/05

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #2616384
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Date of Incorporation	January 10, 1995
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ID #25-1766427

Shareholder:

Ohio Valley Resources, Inc.	4/01/97
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Director:

Robert E. Murray

Revised
3/7/07

TDK COAL SALES, INCORPORATED

P. O. Box 259
R. D. #2, Fermantown Road
Brockway, PA 15824

Officers:

Stanley T. Piasecki	President and Chief Executive Officer	8/11/04
Elmer A. Mottillo	Treasurer	8/22/03
Michael O. McKown	Secretary	3/1/05
Charles E. Shestak	Assistant Secretary	2/01/99

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #00758582
Date of Incorporation	June 28, 1982
ID #25-1422374	

Shareholder:

Energy Resources, Inc.

Director:

Stanley T. Piasecki	8/11/04
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Revised: 02/14/05

UMCO ENERGY, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

Paul B. Piccolini	President	4/28/06
Ronnie D. Dietz	Treasurer and Assistant Secretary	3/1/05
Michael B. Gardner	Secretary Vice-President	3/1/05 5/3/06

Incorporation Information:

State of Incorporation	Pennsylvania; PA Entity #1072295
Date of Incorporation	December 29, 1988
ID #52-1615668	

Shareholder:

Maple Creek Mining, Inc.
and Toni J. Southern

Director:

Robert E. Murray

Revised
3/6/07

UTAHAMERICAN ENERGY, INC.

P.O. Box 902
6750 North Airport Road
Price, Utah 84501

Officers:

		Begin	End
P. Bruce Hill	President and Chief Executive Officer	8/18/06	
P. Bruce Hill	President	12/16/06	
Douglas H. Smith	President	8/18/06	12/16/06
Clyde I. Borrell	President	7/31/98	5/19/06
Robert D. Moore	Treasurer	8/18/06	
Michael O. McKown	Secretary	8/18/06	
Marsha Baker Kocinski	Secretary	7/31/98	6/25/02
Barbara Boyce	Secretary	7/31/98	11/01/99

Incorporation Information:

State of Incorporation Utah;
Charter No. 212673

Date of Incorporation July 30, 1998

ID #34-1874726

Shareholders:

Murray Energy Corporation

Directors:

Robert E. Murray	7/31/98
P. Bruce Hill	8/18/06

Revised
3/7/07

WEST VIRGINIA RESOURCES, INC.

953 National Road
Suite 207
Wheeling, West Virginia 26003

Officers:

		Begin	End
Robert D. Moore	President	10/20/00	
Robert E. Murray	President, CEO	12/27/91	10/20/00
Robert L. Putsock	Treasurer and Assistant Secretary	6/25/01 6/25/01	
Michael O. McKown	Secretary	3/1/05	
Anthony Carl Laplaca	Secretary	12/27/91	3/1/05

Incorporation

Information:

State of Incorporation West Virginia;
Charter No.
00913610154813604

Date of Incorporation December 27, 1991

ID #55-0713676

Shareholder: Mill Creek Mining Company 12/17/91
(100%)

Director: Robert E. Murray

Revised
3/6/07

WYAMERICAN ENERGY, INC.

29325 Chagrin Boulevard
Suite 300
Pepper Pike, Ohio 44122

Officers:

Robert D. Moore

President,
Treasurer and
Secretary

5/3/06

Incorporation Information:

State of Incorporation

Wyoming;
Charter No. 1998003378171

Date of Incorporation

September 22, 1998

ID #34-1875051

Shareholder:

Murray Energy Corporation

Director:

Robert E. Murray

Revised
3/7/07

PART B: OTHER SMCRA PERMITS

APPENDIX V

CURRENT AND PREVIOUS COAL MINING PERMITS

Current and Previous Coal Mining Permits

Company	Andalex Resources, Inc.		EIN: 61-0931325		Wildcat Loadout
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Andalex Resources, Inc. P.O. Box 902 Price, Utah 84501	007/033	Utah	DOGM	42-01864	
				1211-UT-09-01864-01	

Company	Andalex Resources, Inc.		EIN: 61-0931325		Centennial Project
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Andalex Resources, Inc. P.O. Box 902 Price, Utah 84501	007/019	Utah	DOGM	42-01474	
				42-01750	
				42-02028	

Company	Genwal Resources, Inc.		EIN: 87-0533099		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Genwal Resources, Inc. P.O. Box 1077 Price, Utah 84501	015/032	Utah	DOGM	42-01715	Nov. 21, 1991
				42-02356	

Company	West Ridge Resources, Inc.		EIN: 87-0585129		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
West Ridge Resources, Inc. P.O. Box 1077 Price, Utah 84501	007/091	Utah	DOGM	42-02233	March 12, 1999

Company	Belmont Coal, Inc.		EIN: 31-153-6602		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Belmont Coal, Inc. Box 156 30799 PineTree Road Pepper Pike, Ohio 44124	D-0241	Ohio	ODNR	33-04397	7-31-97
	D-1020	Ohio	ODNR	33-03048	7-2-93
Company	KenAmerican Resources Inc.		EIN: 61-1264385		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
KenAmerican Resources Inc. 1008 South Broadway Lexington Kentucky 40504	889-5009	KY	DSMRK	1517606	10-25-94
Company	Onedia Coal Company Inc.		EIN: 62-1011712		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Onedia Coal Co. Inc., 29525 Chagrin Boulevard, Suite 111 Pepper Pike, Ohio 44122	U0-359	WV	DEP	46-05243	2-20-92
	U0-524	WV	DEP	46-06043	2-28-92
	U0-620	WV	DEP	46-06213	2-28-92
	D-7-82	WV	DEP	46-06557	2-28-92

	D-47-81	WV	DEP	46-06557	2-28-92
	D-46-82	WV	DEP	46-06522	2-28-92
	U-2016-89	WV	DEP	46-07757	2-28-92
	P-154-81	WV	DEP	N/A	N/A
	P-62-81	WV	DEP	N/A	N/A
	P-2043-89	WV	DEP	N/A	N/A
	S-2004-87	WV	DEP	46-06766	2-28-92
	S-71-85	WV	DEP	46-06766	2-28-92
Company	MonValley Transportation Center Inc.		EIN: 62-1011712		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
MonValley Trans Center Inc. P.O. Box 135 1060 Ohio Avenue Glassport, PA 15045	02851602	PA	DEP	N/A	N/A
Company	Oklahoma Coal Co.		EIN: 34-1673480		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
The Oklahoma Coal Co. Suite 111, 29525 Chagrin Blvd Pepper Pike, Ohio 44122	D-0230	OH	DOR	N/A	N/A
Company	Maple Creek Mining Inc.,		EIN: 25-1755305		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Maple Creek Mining Inc. 981 Route 917 Bentleyville, Pa 15314	63841302	PA	PA DEP	36-00970	1970
	63733706	PA	PA DEP	1211-PA20-0058-03	1970
	63723707	PA	PA DEP	1211-PA20-0058-04	1970

Company	Energy Resources, Inc.		EIN: 25-1755305		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Energy Resources Inc. P.O. Box 259 Brockway, PA 15824	33840125	PA	DEP	36-02695	5-25-88
	33860102	PA	DEP	36-02695	5-25-88
	17880102	PA	DEP	36-02695	5-25-88
	33870113	PA	DEP	36-02695	5-25-88
	33830115	PA	DEP	36-02695	5-25-88
	24880101	PA	DEP	36-02695	5-25-88
	24880103	PA	DEP	36-02695	5-25-88
	24890108	PA	DEP	36-02695	5-25-88
	24900102	PA	DEP	36-02695	5-25-88
	24900104	PA	DEP	36-02695	5-25-88
	24900103	PA	DEP	36-02695	5-25-88
	24890101	PA	DEP	36-02695	5-25-88
	24890102	PA	DEP	36-02695	5-25-88
	24960101	PA	DEP	36-02695	5-25-88
Company	Canterbury Coal Company		EIN: 25-112473		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
Canterbury Coal Company R.D. No. 1, Box 119 Avonmore, PA 15618	SMP # 039000112	PA	DEP	3600813	N/A
	SMP # 03940111	PA	DEP	3605708	N/A
	CMAF 03841302	PA	DEP	N/A	N/A
	CRDA 03743701	PA	DEP	N/A	N/A
	CRDA 03950701	PA	DEP	N/A	N/A

Company	The Ohio Valley Coal Company		EIN: 34-1041310		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
The Ohio Valley Coal Company 56854 Pleasant Ridge Road Alledonia, OH 43902	D-3060	OH	ODNR	33-01159	25-May-88
Company	UMCO Energy, Inc.		EIN: 52-1615668		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
UMCO Energy, Inc. 29525 Chagrin Boulevard, Suite 111 Pepper Pike, OH 44122	63-921301	PA	DEP	N/A	N/A
Company	The American Coal Company		EIN: 73-1543124		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
The American Coal Company P.O. Box 727 Harrisburg, IL 62946	No. 2	IL	IDNR	11-02752	N/A
	No. 255	IL	IDNR	N/A	N/A
	No. 257	IL	IDNR	N/A	N/A
	No. 306	IL	IDNR	N/A	N/A
	No. 165804AAA	IL	IDNR	N/A	N/A
	No. 110061727	IL	IDNR	N/A	N/A
Company	PennAmerican Coal, L.P.		EIN: 25-1800809		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
PennAmerican Coal, L.P. R.D. No. 1, Box 119A Avonmore, PA 15618	32951301	PA.	MCM	36-00970	

Company	UtahAmerican Energy, Inc.		EIN: 34-1874726		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
UtahAmerican Energy, Inc. P.O. Box 986 Price, Utah 84501	ACT/ 007- 013	Utah	Division of Oil, Gas and Mining	42-00100	12/24/78
				42-02241	04/05/99

Company	American Energy, Corporation		EIN: 31-1550443		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
American Energy Corp. 43521 Mayhugh Hill Road Township Highway 88 Beallsville, Ohio 43716	D-0425	Ohio	ODNR	33-01070	
	D-1159	Ohio	ODNR		

Company	TDK Coal Sales, Inc.		EIN: 25-1422374		
Address:	Permit #	State	Regulator Authority	MSHA #	Date Issued
TDK Coal Sales, Inc. P.O. Box 259 R.D. #2, Fermantown Road Brockway, PA. 15824	16910104	PA	PaDep	3608867	
	33960109	PA	PaDep		
	24970104	PA	PaDep		